

ABSTRACT

PERCEIVED PARENTING STYLE AND SELF-EFFICACY FOR FRUIT AND VEGETABLE CONSUMPTION AMONG UNIVERSITY STUDENTS LIVING ON CAMPUS

Shannon Summers, MS
School of Family, Consumer, and Nutrition Sciences
Northern Illinois University, 2014
Josephine Umoren, Ph.D., Director

Research suggests that parenting style has long-term implications on the emotional and behavioral development of children. The current study investigated the influence of parenting style on dietary behaviors beyond adolescence by examining the relationships between perceived parenting style, self-efficacy for fruit and vegetable consumption, and weight status among 227 college students living in campus residences. Spearman's rank-order correlations, linear regression, and independent sample t-test statistical analyses were used to test the hypotheses. Results demonstrated that authoritative parenting was positively correlated with self-efficacy for fruit and vegetable consumption ($p < .01$) and authoritarian parenting was positively correlated with body mass index ($p = .04$). Post-hoc analysis also indicated that family meal frequency was positively associated with authoritative parenting ($p < .01$) and negatively associated with BMI ($p < .01$). These results suggest that parenting style continues to influence nutrition and weight status into adulthood, even when children are no longer living at home. Future studies should continue to explore how remembered parenting style influences nutrition in adulthood, with incorporation of a quantitative measure of dietary intake. Additionally, longitudinal research is needed to provide insight into the relationship between parenting style and weight status throughout the lifespan.

NORTHERN ILLINOIS UNIVERSITY

DEKALB, ILLINOIS

DECEMBER 2014

PERCEIVED PARENTING STYLE AND SELF-EFFICACY FOR FRUIT
AND VEGETABLE CONSUMPTION AMONG UNIVERSITY
STUDENTS LIVING ON CAMPUS

BY

SHANNON SUMMERS
©2014 Shannon Summers

A THESIS SUBMITTED TO THE GRADUATE SCHOOL
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE
MASTER OF SCIENCE

DEPARTMENT OF FAMILY, CONSUMER, AND NUTRITION SCIENCES

Thesis Director:

Josephine Umoren, Ph.D.

ACKNOWLEDGEMENTS

Completion of this research project would not have been possible without the support and guidance of several very dedicated faculty members. To begin, I would like to express my gratitude to Dr. Josephine Umoren for her leadership and direction as the advisor of this research project. Dr. Sheila Barrett was also a valuable member of the committee whose statistical expertise and passion for research pushed me to critically analyze my data and develop a deep understanding of the statistical process. I would also like to thank Dr. Linda Derscheid and Dr. Jane Rose Njue for their willingness to serve on my committee and provide insight into family dynamics pertaining to parenting styles. Finally, data collection would not have been possible without the assistance of the Office of Registration and Records who played a vital role in the recruitment process by identifying and contacting potential participants via Northern Illinois University's mass e-mail communication system.

DEDICATION

To my family, Dave, Lauren, Justin, Maria and Linda, who have provided me with unlimited support throughout this process – thank you.

.

TABLE OF CONTENTS

	Page
LIST OF TABLES.....	vi
LIST OF FIGURES.....	viii
LIST OF APPENDICES.....	ix
Chapter	
1. INTRODUCTION.....	1
Justification.....	4
Statement of the Research Problem.....	5
Objectives.....	6
Hypotheses.....	6
2. METHODOLOGY.....	7
Study Design.....	7
Study Sample.....	7
Study Instrument.....	8
Pilot Study.....	11
Data Collection.....	12
Data Analysis.....	13
3. RESULTS.....	16
Characteristics of the Participants.....	16
Self-Efficacy for Fruit and Vegetable Consumption.....	19

Chapter	Page
Testing of the Hypotheses.....	21
Post-Hoc Analysis.....	28
4. DISCUSSION AND CONCLUSION.....	38
Implications.....	47
Limitations.....	49
Conclusion.....	52
REFERENCES.....	54
APPENDICES.....	58

LIST OF TABLES

Table	Page
1. Characteristics of the Participants.....	17
2. Participants' Mean Self-Efficacy Scores.....	20
3. Spearman's Correlation Matrix between Parenting Style and Self-Efficacy.....	21
4. Linear Regression of the Relationship between Parenting Style and Self-Efficacy.....	23
5. Analysis of the Relationship between Parental Authority and Self-Efficacy.....	24
6. Spearman's Correlation Matrix between Parenting Style and BMI.....	25
7. Linear Regression of the Relationship between Parenting Style and BMI.....	27
8. Analysis of the Relationship between Parental Authority and BMI	27
9. Nonparametric Test for Differences in Parenting Style across Demographic Variables.....	29
10. Spearman Correlations between Self-Efficacy Item Scores and Parental Authorities.....	32
11. Mean Self-Efficacy Item Scores by Authoritative Parental Authority.....	33

12. Mean Self-Efficacy Item Scores by Authoritarian Parental Authority.....	34
13. Spearman's Correlation Matrix between Parenting Style and Family Meal Frequency.....	37

LIST OF FIGURES

Figure	Page
1. Pie chart of participants' weight status as indicated by BMI.....	18
2. Histogram of participants' self-efficacy scores.....	20
3. Scatterplot of participants' average self-efficacy for fruit and vegetable consumption and level of perceived authoritarian parenting where R^2 measures the strength of the association	22
4. Scatterplot of participants' BMI and level of perceived authoritarian parenting where R^2 measures the strength of the association.....	26
5. Scatterplot of participants' average self-efficacy for fruit and vegetable consumption and BMI where R^2 measures the strength of the association.....	35
6. Scatterplot of participants' average BMI and family meal frequency where R^2 measures the strength of the association.....	36

LIST OF APPENDICES

Appendix	Page
A. REVIEW OF THE LITERATURE.....	58
B. IRB APPLICATION.....	98
C. IRB APPROVAL.....	105
D. REQUEST FOR STUDENT DATA.....	107
E. FLYER.....	110
F. INFORMED CONSENT.....	112
G. PERMISSION TO USE THE PARENTAL AUTHORITY QUESTIONNAIRE.....	114
H. PARENTAL AUTHORITY QUESTIONNAIRE.....	116
I. PERMISSION TO USE SELF-EFFICACY SURVEY INSTRUMENT.....	121
J. SELF-EFFICACY SURVEY INSTRUMNT.....	123
K. RECRUITMENT E-MAIL.....	125
L. REMINDER E-MAIL	127

CHAPTER 1

INTRODUCTION

Parenting style has been a topic of research for decades. The influence of parenting style is evident in both emotional and behavioral development, including the establishment of health behaviors related to nutritional intake. While parenting style has been shown to be related to emotional outcomes throughout the life course, research on the behavioral impact of parenting style with respect to nutritional intake is lacking past early childhood and adolescence. Research shows that college years are a critical time period that often shapes later life health behaviors, such as dietary intake (1, 2). Therefore, the purpose of this study is to examine the long-term impact of parenting style on self-efficacy for fruit and vegetable consumption among college-aged students living on campus.

Parenting style is considered to be a stable characteristic of a parent that establishes the environmental and emotional framework by which parents raise their children (3). Most commonly, parenting styles are defined as characteristics based upon parental demandingness and responsiveness. Parental demandingness is the amount of control a parent exerts over their child; whereas responsiveness is the amount of support and warmth a parent provides their child (4). One of the premier researchers on parenting style, Dr. Baumrind, developed a parenting style framework based on these concepts. According to Baumrind's typology, parents adopt either an authoritarian, authoritative, or permissive parenting style (5). Authoritarian parents are described as displaying high demandingness and low responsiveness (4-8).

Permissive parents display low demandingness and low responsiveness, and may be described as either indulgent or neglectful (5, 7, 8). Lastly, authoritative parents display high demandingness and high responsiveness (4-8). Although there has been some variance in the literature, the authoritative parenting style has most commonly and consistently been identified as the ideal parenting style for promoting children's optimal development.

Authoritative parenting style has been shown in the literature to be related to many beneficial childhood, adolescence, and later-life outcomes, such as improved decision-making skills (4, 9), less depressive symptoms (7), better emotional adjustment (10), and improved psychological flexibility (6). However, parenting style has not been tied to emotional outcomes alone. Research has also demonstrated that there is a relationship between parenting style and dietary habits (11).

Beginning in childhood, parenting style has been shown to have an influence on parental feeding style (7, 11, 12). Similar to findings related to emotional adjustment, authoritative parenting has been found to be the ideal parenting style with regards to dietary intake (13). Authoritative parenting has been found to be correlated with more healthful dietary intake (13), including increased intake of dairy and vegetables (11), and decreased intake of low nutrient dense foods, fats, and oils among children and adolescents (14). Research suggests that fruit and vegetable consumption is a predictor of both overall diet quality and weight status (15), and the adverse effects of excessive body weight have been well documented in the literature with respect to both physical and mental health (16). One systematic review of the literature identified a wealth of research demonstrating evidence of a relationship between childhood and adolescence overweight status and adult morbidity, especially related to

cardiometabolic conditions including later-life diabetes, stroke, coronary heart disease, and hypertension (16). This relationship is paralleled by evidence of an association between childhood and adolescence overweight or obesity and adult overweight or obesity, indicating that overweight and obese children are likely to remain overweight and obese as adults (17).

Due to the increasing rate of childhood obesity in recent decades and its negative impact on overall health, researchers have examined the relationship between parenting style and child weight status. While many factors, such as increased portion sizes and decreased physical activity, may contribute to the increase in childhood weight status, parents also have the opportunity to establish a home environment that promotes healthful behaviors, beliefs, and norms (18). Parents have the opportunity to model healthful dietary habits and directly control the types of foods and activities allowed in the home; therefore allowing parents to play a vital role in the prevention and treatment of childhood overweight (18). Although studies have had conflicting findings, research has shown that children of authoritarian and permissive parents are more likely to be overweight or obese than children of authoritative parents (3, 19). The increased risk for overweight or obesity among these children is likely related to both cognitive and behavioral impacts of parenting style as parental feeding practices, parental behaviors, and parental influences not only mold child health behaviors, but also influence the development of attitudes and beliefs related to specific foods and eating habits (18).

Although the relationship between parenting style and weight status has been examined throughout childhood and adolescent years, there is a lack of literature examining this relationship in adulthood (19). College years are a time period characterized by increased independence and distance from parental controls; however, the parental relationship may still

have a significant impact in the process of adjusting to adulthood (10, 20). Additionally, the health behaviors established during these years often have an impact on later-life health status. Adequate fruit and vegetable consumption is a specific health behavior of interest because it has been shown to be related to lower risk of chronic diseases such as cardiovascular disease and cancer (1, 2).

Self-efficacy, the confidence an individual has in their ability to execute a behavior, has perhaps been the most widely studied psychological correlate related to fruit and vegetable consumption (21). More specifically, dietary self-efficacy is considered to be “one’s perceived capability to choose more healthy foods even in difficult circumstances” (22). This cognition has been studied as a potential mediator of the relationship between parental influences and adolescent dietary intake with results indicating that self-efficacy for making healthy food choices is associated with making healthful food choices (22). While numerous studies have identified a direct association between an individual’s self-efficacy and their fruit and vegetable intake (1, 2, 15, 23-25), there is a lack of literature examining the relationship between parenting style and self-efficacy for fruit and vegetable intake in the adult population. Therefore, the aim of this study is to evaluate the relationship between parenting style and self-efficacy for fruit and vegetable consumption among college-aged students living on campus.

Justification

The research literature demonstrates that parenting style can be linked to both childhood and later life outcomes (4, 6-7, 9-10). The influence of parenting style is evident in both

emotional and behavioral development, including the establishment of health behaviors related to nutritional intake (7, 11-14). While parenting style has been shown to be related to emotional outcomes throughout the life course, research on the behavioral impact of parenting style with respect to nutritional intake is lacking past early childhood and adolescence. For many individuals, college is the first time they have primary responsibility for obtaining and/or preparing food. This is a critical time period for independent establishment of nutrition behaviors, because dietary habits established at this time often shape later life health (1, 2). Although college years are characterized by increased independence, there is evidence that the parental relationship plays a significant role in the process of adjusting to adulthood (10, 20). However, there is insufficient research regarding the relationship between parenting style and self-efficacy for fruit and vegetable consumption in adulthood. Therefore, there is a need for research regarding the relationship between college students' perceived parenting style and their self-efficacy to consume fruits and vegetables.

Statement of the Research Problem

Is perceived parenting style associated with self-efficacy for fruit and vegetable consumption and/or weight status, as indicated by BMI, among university students living on campus?

Objectives

There were two objectives for this study:

1. To determine the relationship between perceived parenting style and self-efficacy for fruit and vegetable consumption among college students living on campus.
2. To determine the relationship between perceived parenting style and weight status, as indicated by BMI, among college students living on campus.

Hypotheses

There are two hypotheses for this study:

1. H₁: Participants who perceive their parents as authoritative will have higher self-efficacy for fruit and vegetable consumption as compared to participants who perceive their parents as authoritarian or permissive.
2. H₂: Participants who perceive their parents as authoritative will have lower BMI scores than participants who perceive their parents as authoritarian or permissive.

CHAPTER 2

METHODOLOGY

Study Design

The study design implemented was a non-experimental, cross-sectional study. The study utilized a convenience sample of students at a Midwestern university who lived on campus.

Study Sample

In order to be eligible for participation, participants in this study had to be full-time students enrolled at a Midwestern university, at least 18 years of age, and residents on campus. Prior to study initiation, an application was submitted to the Institutional Review Board (IRB) to conduct human subjects research (Appendix B) and approval was obtained (Appendix C). Once IRB approval was obtained, a list of eligible students was compiled following submission of a Request for Student Data submitted to the Office of Registration and Records (Appendix D). Once the contact information for eligible participants was compiled, potential study participants were contacted following the submission of a Request for Mass E-mail to the university's Division of Information Technology. In addition to e-mail contact, flyers were displayed in residence halls on campus advertising the study in order to help recruit participants (Appendix E). Before any flyers were displayed, approval was obtained from Student Involvement and Leadership Development and the IRB.

When a potential participant visited the online study link, they were presented with a study description and informed consent (Appendix F). The informed consent explained that all information obtained through the questionnaire would be kept confidential, provided appropriate information regarding who to contact should they have any questions or concerns, and informed them of their rights as a research participant. Lastly, they were informed that by answering ‘yes’ they were giving consent to participate in the study and the questionnaire would begin, however if they answered ‘no’ they would not be given access to the questionnaire. The final survey question instructed participants to send their name in an e-mail to an e-mail account established specifically for this study if they were interested in being eligible for the raffle. Entrance in the raffle was voluntary and it was hoped that by offering an incentive willingness to participate in the study would be increased. Upon study completion, one participant’s name was drawn at random to receive a \$25 Target gift card.

Study Instrument

Data collection consisted of the administration of one questionnaire consisting of two survey instruments and included demographic information. First, with the author’s permission (Appendix G), participants completed the Parental Authority Questionnaire (PAQ) (Appendix H). The PAQ was developed by Dr. John Buri and measures Dr. Baumrind’s typology of parental authority. The scale is comprised of 30 items and asks respondents to describe the degree to which a given statement applies to their relationship with their caretaker during the years they spent growing up at home. Use of the word “caretaker” allows for individuals who

were raised non-traditionally or by someone other than their mother and/or father to still be able to respond. Of the 30 total items, 10 items assess permissiveness, 10 assess authoritarianism, and 10 assess authoritativeness. All item responses are based on a five-point Likert scale with one representing “strongly disagree” and five representing “strongly agree.” Statements related to each parenting style are dispersed throughout the questionnaire to help prevent respondents from identifying common themes and biasing their responses to what they may perceive is most desirable. Questions 1, 6, 10, 13, 14, 17, 19, 21, 24, and 28 measure perceived permissive parenting style, with a higher total score indicating higher levels of perceived permissive parenting. Statements 2, 3, 7, 9, 12, 16, 18, 25, 26, and 29 are related to authoritarian parenting, with a higher total score indicating higher levels of perceived authoritarian parenting. Similarly, higher scores for responses to statements 4, 5, 8, 11, 15, 20, 22, 23, 27, and 30 indicate higher levels of perceived authoritative parenting. Therefore, based on the participants’ responses to the 30-item scale, their perception of their caretakers parenting style was identified (26).

The PAQ has been shown to be both a valid and reliable instrument for measuring Dr. Baumrind’s parenting prototypes (26, 27). Reliability and validity testing was conducted on the PAQ utilizing an undergraduate student population. With respect to each parental authority, test-retest reliability coefficients ranged from .75 to .92 and Cronbach alpha values for internal consistency among items ranged from .74 to .87, demonstrating high reliability given a 10-item scale. Additionally, validity testing was conducted. In accordance with Dr. Baumrind’s parenting typology, parental warmth is a determinant of parental authority. Assessing the relationship between student responses to the PAQ and Parental Nurture Scale, authoritative

parenting was found to be strongly related to parental nurturance, authoritarian parenting was inversely related to parental nurturance, and permissive parenting was unrelated to parental nurturance. Therefore, this indicates that the PAQ is a valid measure assessing parental authority with respect to parental warmth. Additionally, discriminant-related validity revealed that there is divergence in responses across the three parental authority scales. Therefore, the authoritative, authoritarian, and permissive parenting styles were not found to be related to one another. Lastly, no statistically significant correlations were found between the PAQ and the Marlowe-Crowne Social Desirability Scale, indicating that the PAQ does not seem to be vulnerable to social desirability response bias. Overall, the PAQ has been found to be an appropriate instrument for assessing parental authority among older adolescents and young adults, including college students (26).

The second instrument used with permission from the author (Appendix I) is a measure of participant's self-efficacy to consume fruits and vegetables (Appendix J). This scale consists of nine statements measuring participants' self-efficacy to consume fruits and vegetables under a variety of circumstances. Self-efficacy is evaluated through a five-point Likert scale, with one representing "not at all sure" and five representing "extremely sure." Therefore, participants' self-efficacy scores can be assessed item-by-item as well as overall across all statements. This scale was developed and utilized in a study conducted by Henry, Reimer, Smith and Reicks (2006) attempting to identify the usefulness of the Transtheoretical Model for interventions aiming to increase fruit and vegetable consumption. The Cronbach's alpha score for the self-efficacy scale items was $\alpha = 0.90$, indicating excellent internal consistency (28). Although this was developed and tested in low-income African American women, the difficult situations in

which self-efficacy was tested in these mothers seem to be challenges that college students may also face on a regular basis (i.e. when in a rush, tired, away from home).

In addition to the two survey instruments, demographic data and participants' self-reported height and weight were also collected in the questionnaire. Requested demographic data included participants' age, gender, ethnicity, height, weight and birth order. Lastly, students were asked if they had ever taken a college level nutrition course. This question was included because it could be a potential confounding factor affecting participants' self-efficacy for fruit and vegetable consumption.

Pilot Study

Prior to beginning data collection, a pilot study was conducted in order to assess the length and clarity of the survey instrument. This survey link was distributed via e-mail to approximately ten students attending a public university on the East Coast. In order to participate in the pilot study, students had to live on campus and be at least 18 years of age. The only adjustment made to the survey measure for the pilot study was to change the last question to be a free text box requesting participants to state how long it took them to complete the survey and to provide any other comments related to survey clarity or design. A total of three participants completed the pilot study. The average length of time for survey completion was between 10 and 15 minutes. No feedback received from participants in the pilot study indicated the need for adjustments to be made to the survey measure before it was utilized to conduct this study.

Data Collection

Data collection was conducted through a free online survey and questionnaire site, <https://www.surveymonkey.com>. During the time frame of data collection, university statistics indicated that there were 3,987 students living in residence halls on campus. Therefore, the target sample size for this study was 350 participants. The target sample size was determined based upon Krejcie and Morgan's published table for determining sample size from a given population. This table was developed based upon a formula established to determine sample size that was published by the National Education Association (29).

Upon receiving IRB approval and obtaining student information requested via a Request for Student Data submitted to the Office of Registration and Records, a mass e-mail was sent out to potential participants believed to meet the inclusion criteria. The e-mail included a description of the study, inclusion criteria, contact information, deadline for survey completion, and a link to the survey (Appendix K). One week following the initial e-mail, a reminder e-mail was sent to potential participants requesting their participation (Appendix L). The initial deadline for survey completion was set for two weeks following dissemination of the initial recruitment e-mail. However, failure to reach the target sample size resulted in dispersal of a second follow-up mass e-mail and extension of the study period. Ultimately the time frame of data collection was extended and lasted for one month.

Survey data did not include any participant identification information as participants' submission into the raffle drawing was done by contacting the study e-mail address, rather than by providing personal contact information in the survey instrument.

Data Analysis

The data set collected from the study was analyzed using the Statistical Package for the Social Sciences (SPSS) (30). The data set was compiled and extracted in an Excel file from the survey tool utilized, surveymonkey.com, after which it was uploaded into SPSS for statistical analysis.

Demographic information collected for this study was analyzed by running descriptive statistics. Nonparametric testing was conducted utilizing the Mann-Whitney U test to assess the differences in perceived parenting styles with respect to participants' demographic information. This test was selected because parenting styles were measured on the ordinal level and demographic data, such as gender and ethnicity, was measured on the nominal level.

To test H_1 , *participants who perceive their parents as authoritative will have higher self-efficacy for fruit and vegetable consumption as compared to participants who perceive their parents as authoritarian or permissive*, Spearman's rank-order correlations, linear regression, and independent sample t-test statistical analyses were employed. Spearman's rank-order correlations were run in order to assess the strength and direction of the relationship between two ordinal variables. Therefore, this analysis investigated the degree to which participant self-efficacy for fruit and vegetable consumption was related to each parental authority typology. Additionally, a linear regression with dummy variables was utilized to compare the mean self-efficacy scores between parenting style groups. For this analysis, participants were categorized into the parenting style group they most identified with based on their responses to the PAQ. This statistical test was selected because self-efficacy is a

continuous, scalar variable and parenting style is a polytomous, categorical variable. Lastly, independent sample t-tests were utilized. For this analysis, all participants were dichotomized into either 'high' or 'low' groups for each of the three parenting styles based on the median split. This test assessed the differences in mean self-efficacy scores between two groups with respect to each parental authority typology. Post-hoc analysis of differences in mean self-efficacy scores for each item on the self-efficacy scale again utilized multiple statistical analyses including Spearman's rank-order correlations, one-way analysis of variance (ANOVA), and independent sample t-tests. These tests were utilized with respect to the different methods of classifying participants' perceived parenting style described above.

In order to test H_2 , *participants who perceive their parents as authoritative will have lower BMI scores than participants who perceive their parents as authoritarian or permissive*, Spearman's rank-order correlations, linear regression, and independent sample t-test statistical analyses were again employed. Spearman's rank-order correlations were run in order to assess the strength and direction of the relationship between the parental authorities and BMI. This test was selected because perceived parental authority was measured on the ordinal level and BMI was measured on the ratio level. Therefore, this analysis investigated the degree to which participant BMI was related to each parental authority typology. A linear regression with dummy variables was run to compare mean BMI scores between parenting style groups with participants classified based upon which parenting style they predominantly identified with. Finally, independent sample t-tests were utilized to analyze differences in BMI scores between groups with respect to each of the three parenting styles based on the median split.

Post-hoc analysis of the relationship between BMI and self-efficacy for fruit and vegetable consumption was conducted using a Spearman's rank-order correlation. This test was selected because self-efficacy was measured at the ordinal level and BMI was measured at the ratio level. Additionally, family meal frequency was assessed in relation to both perceived parenting style and BMI. These relationships were assessed utilizing a Spearman rank-order correlation and a Pearson product-moment correlation, respectively. These tests were selected because family meal frequency and BMI were measured at the ratio level whereas parenting style was measured at the ordinal level. The level of significance for all statistical tests conducted in this study was set at $\alpha = 0.05$.

CHAPTER 3

RESULTS

Characteristics of the Participants

Table 1 outlines the characteristics of the participants who completed this study. The study sample consisted of 227 college students who lived on campus at the time of data collection. A total of 3,987 students lived on campus during the data collection period and were likely eligible to participate in the study. A total of 232 students responded, out of which 227 students completed the questionnaire, resulting in a 5.7% response rate.

The mean age of participants in this study was 19.87 ± 2.13 years with a range of 18-32 years, and the majority of participants (77.5%, $n=176$) were between 18-20 years of age. Similarly, the majority of participants were freshmen in college (55.1%, $n=125$). The study population was predominantly female (75.8%, $n=172$) and of Caucasian ethnicity (66.1%, $n=150$). With respect to birth order, most participants were first born children (40.1%, $n=91$), and most participants reported eating family meals 5-7 days of the week during their years raised at home (34.8%, $n=79$). It is also important to note that the majority of the study participants had not taken a collegiate nutrition course (71.4%, $n=162$). The average BMI score of participants was 24.75 ± 5.39 and BMI scores ranged from 15.30-53.20. Additionally, the majority of study participants were of normal weight as indicated by BMI status (56.8%, $n=129$). Figure 1 depicts participants' weight status as indicated by BMI. Lastly, the majority of

Table 1: Characteristics of the Participants

Characteristics	<i>N</i> (%)
Gender	
Male	55 (24.2)
Female	172 (75.8)
Age Group	
18-20 years	176 (77.5)
21-24 years	41 (18.1)
25+ years	10 (4.4)
Birth Order	
Oldest	91 (40.1)
Youngest	74 (32.6)
Middle	62 (27.3)
Ethnicity	
Caucasian	150 (66.1)
Hispanic/Latino	26 (11.5)
African American	33 (14.5)
Asian/Pacific Islander	11 (4.8)
Native American	1 (0.4)
Other	6 (2.6)
Family Meal Frequency	
Zero days	27 (11.9)
1-2 days	63 (27.8)
3-4 days	58 (25.6)
5-7 days	79 (34.8)
Year in School	
Freshman	125 (55.1)
Sophomore	40 (17.6)
Junior	49 (21.6)
Senior	13 (5.7)
Taken a Nutrition Course	
Yes	65 (28.6)
No	162 (71.4)
BMI Status^a	
Underweight	14 (6.2)
Normal weight	129 (57.1)
Overweight	48 (21.2)
Obese	35 (15.5)
Predominant Parenting Style^b	
Permissive	14 (6.2)
Authoritarian	90 (39.6)
Authoritative	137 (60.4)
TOTAL	227 (100)

Note. ^a One participant failed to report their height and weight, therefore the total participants represented by BMI status is 226.

^b The number of participants within parenting styles does correspond with total number of participants. Some participants perceived multiple parenting styles equally and are therefore represented in multiple parenting style groups.

participants' (60.4%, $n = 137$) predominantly perceived their caregiver's parenting style to be authoritative. It is important to note that 12 participants scored identical values for multiple parenting styles based on their responses to the PAQ items, indicating that they perceived their caregiver to demonstrate multiple parenting styles equally. This explains the discrepancy in the number of participants represented across parenting styles and the total number of participants in the study population.

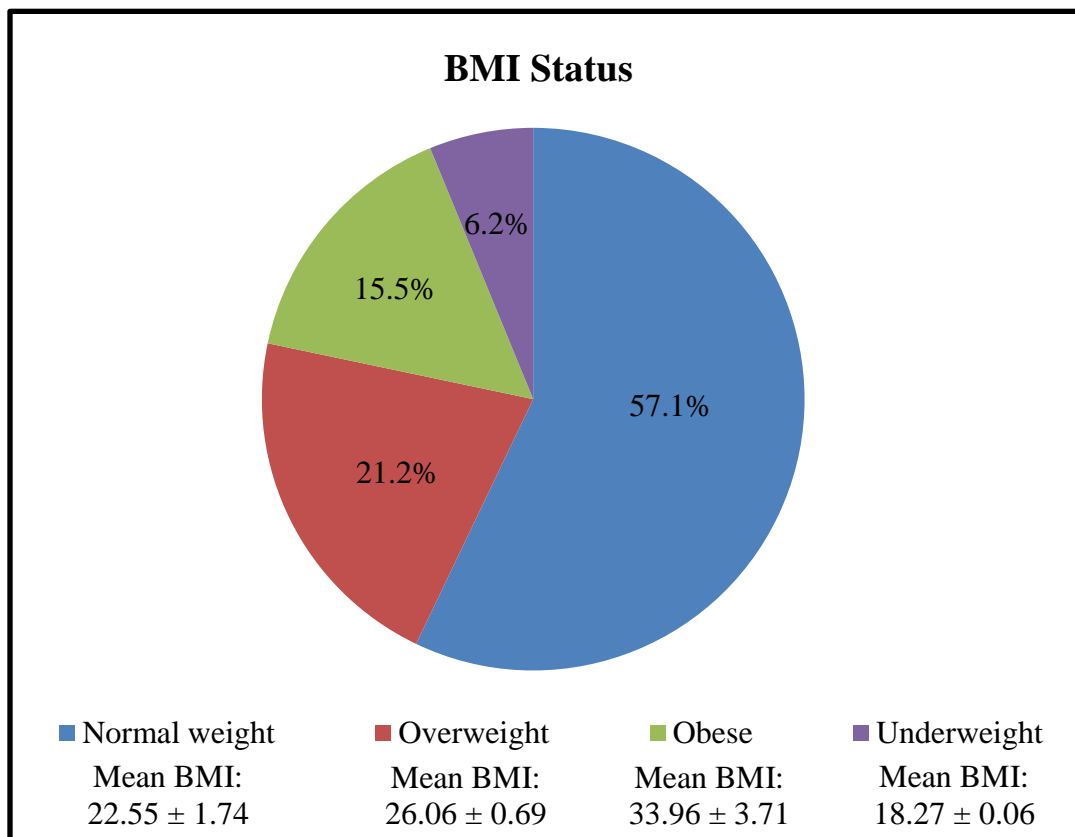


Figure 1: *Pie chart of participants' weight status as indicated by BMI.*

Self-Efficacy for Fruit and Vegetable Consumption

The data in Table 2 represents participants' average self-efficacy for fruit and vegetable consumption within participants' predominantly perceived parenting style groups. Self-efficacy for fruit and vegetable consumption was calculated by averaging participants' responses to nine self-efficacy questions assessing participants' perceived ability to consume fruits and vegetables under a variety of challenging situations. Self-efficacy was assessed based upon a five-point Likert scale. Therefore, the minimum possible score a participant could receive was one and the maximum score was five. Average, rather than total, scores were reported so that scores may be interpreted based upon the self-efficacy scale, where one indicated a participant was "not at all sure" and five indicated a participant was "extremely sure" they could consume fruit and/or vegetables in a variety of challenging scenarios. Overall, the mean self-efficacy score for fruit and vegetable consumption was 3.80 ± 0.88 and ranged from 1.33-5.00. As shown in Table 2, the average overall self-efficacy score corresponded almost identically with the mean self-efficacy for fruit and vegetable consumption for participants who perceived their parents to be authoritarian ($M = 3.80 \pm 0.86$). However, the mean self-efficacy for fruit and vegetable consumption was slightly higher ($M = 3.86 \pm 0.88$) for participants who perceived their parents to be permissive and slightly lower ($M = 3.79 \pm 0.88$) for participants who perceived their parents to be authoritative. The total number of participants, $N = 227$, does not equal the sum of participants represented across each parenting style because 12 participants reported equal perception of multiple parenting styles. Therefore, their scores are included within multiple parenting style groups. Figure 2 shows the histogram of self-efficacy scores.

Table 2: Participants' Mean Self-Efficacy Scores

Descriptive Variables ^a	Permissive (<i>n</i> =14)	Authoritarian (<i>n</i> =90)	Authoritative (<i>n</i> =137)	All Participants (<i>N</i> =227)
Self-efficacy, mean \pm SD	3.86 \pm 0.88	3.80 \pm 0.86	3.79 \pm 0.88	3.80 \pm 0.88

Note. SD = Standard Deviation

^a The number of participants within parenting styles does correspond with total number of participants. Some participants perceived multiple parenting styles equally and are therefore represented in multiple parenting style groups.

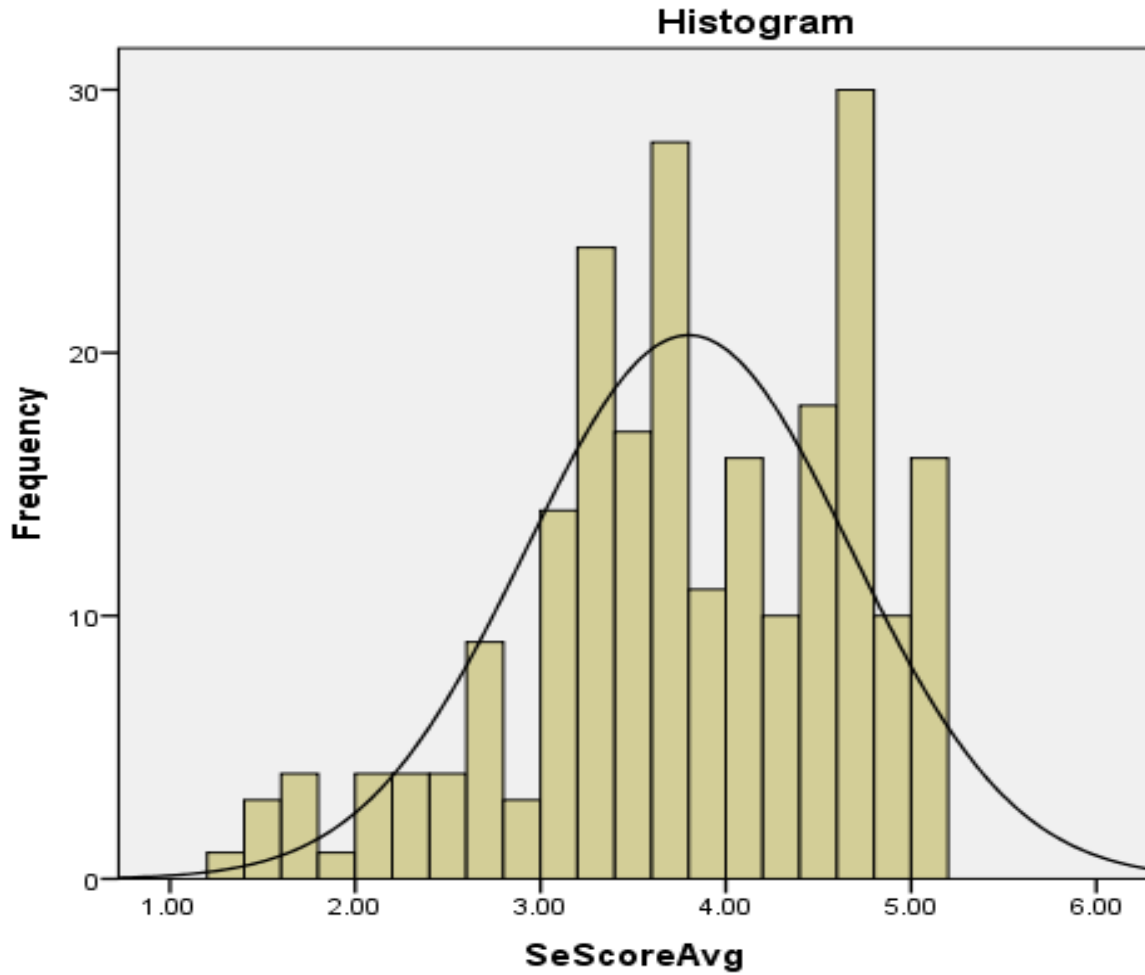


Figure 2: Histogram of participants' self-efficacy scores.

Testing of Hypotheses

To test H_1 , *participants who perceive their parents as authoritative will have higher self-efficacy for fruit and vegetable consumption as compared to participants who perceive their parents as authoritarian or permissive*, multiple statistical analyses were employed. Spearman's rank-order correlations were utilized to assess the relationship between participants' overall score for each parenting style, as obtained from their answers to the PAQ, and their average self-efficacy for fruit and vegetable consumption. This allowed for participants self-efficacy for fruit and vegetable consumption to be assessed in relation to the degree with which they perceived each parenting style. Results of this analysis are provided in Table 3 and indicate that as authoritative parenting increased, participants' self-efficacy for fruit and vegetable consumption also increased ($r_s = .19, p = <.01$). This finding is illustrated in Figure 3. Alternatively, no significant relationships were identified between authoritarian ($r_s = .12, p = <.07$) or permissive ($r_s = -.05, p = <.56$) parenting and participant self-efficacy. Therefore, the results of these correlations infer that perception of authoritative parenting was significantly positively correlated with self-efficacy for fruit and vegetable consumption.

Table 3: Spearman's Correlation Matrix between Parenting Style and Self-efficacy

	Permissive $N = 227$	Authoritarian $N = 227$	Authoritative $N = 227$
	r_s (p)	r_s (p)	r_s (p)
Self-efficacy	-.05 ($p = .42$)	.12 ($p = .07$)	.19** ($p = <.01$)

Note. * $p < 0.05$, two-tailed. ** $p < 0.01$, two-tailed.

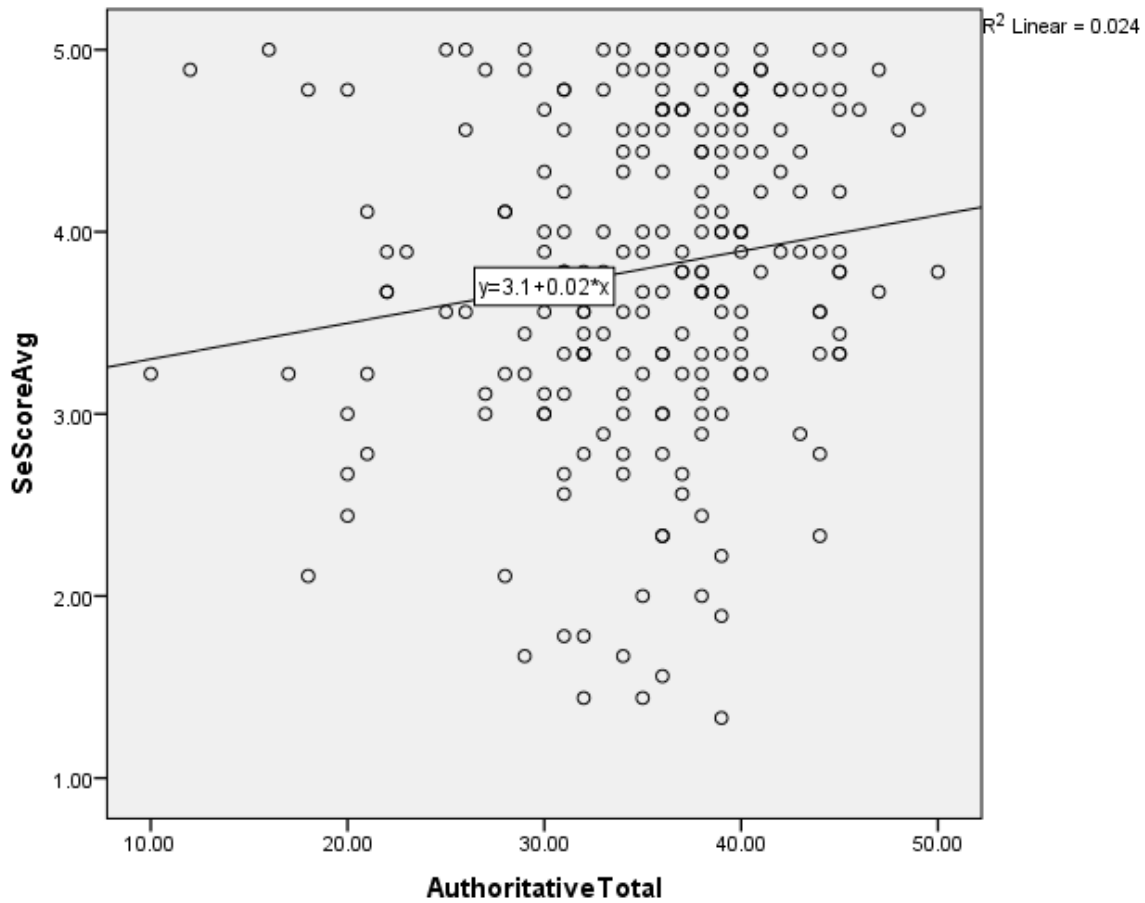


Figure 3: Scatterplot of participants' average self-efficacy for fruit and vegetable consumption and level of perceived authoritative parenting where R^2 measures the strength of the association.

An alternative method of analysis for testing H_1 utilized a linear regression with dummy variables to compare mean self-efficacy scores between parenting style groups. For this analysis, participants were grouped by the parenting style for which they predominantly identified based upon their responses to the PAQ. Authoritative parenting was not included in the linear regression analysis and is therefore the reference variable. The results of this analysis

indicate that there was no significant difference in mean self-efficacy for fruit and vegetable consumption between parenting style groups. Table 4 shows a summary of these results.

Table 4: Linear Regression of the Relationship between Parenting Style and Self-Efficacy

	<i>B</i> Coefficient	Standard Error	<i>t</i> -statistic	<i>p</i> -value
Permissive	.06	.24	.26	.80
Authoritarian	<.01	.12	<.01	.99

Based on an alternative grouping method demonstrated in the literature of other studies also utilizing the PAQ, additional analysis was run to test H_1 . For this analysis, a median-split method of grouping was employed to categorize participants as perceiving either high or low authoritative parenting. Therefore, those participants who scored above the median for authoritative parenting ($Md. = 36$) were categorized as perceiving their caregiver as highly authoritative, whereas those who scored below the median were considered to perceive their caregiver as demonstrating low authoritativeness. The same coding method was utilized for authoritarian and permissive parenting styles based on their median splits of 33 and 24, respectively. In order to compare the mean differences between groups, independent sample *t*-tests were utilized. Results of the analysis indicate that those participants who perceived their caregiver as highly authoritative had significantly higher self-efficacy for fruit and vegetable consumption as compared to those participants who perceived low authoritative parenting, $t(225) = -2.82, p = <.01$. Differences in self-efficacy with respect to high and low authoritarian

and permissive parenting styles were not found to be statistically significant. Table 5 shows a summary of these results.

Table 5: Analysis of the Relationship between Parental Authority and Self-Efficacy

	High	Low		
	$M \pm SD$ (n)	$M \pm SD$ (n)	t -statistic	p -value
Permissive	3.723 \pm .914 ($n = 131$)	3.904 \pm .815 ($n = 96$)	1.539	.13
Authoritarian	3.900 \pm .841 ($n = 127$)	3.671 \pm .908 ($n = 100$)	-1.965	.05
Authoritative	3.942 \pm .836 ($n = 128$)	3.616 \pm .897 ($n = 99$)	-2.821**	<.01

Note. * $p < 0.05$, two-tailed. ** $p < 0.01$, two-tailed.

Both methods of participant categorization described above resulted in dichotomization of a continuous variable. Therefore, although this practice is common in statistical analyses, it is important that the results be interpreted with caution as the practice of dichotomizing continuous variables can result in loss of power.

In order to test H_2 , *participants who perceive their parents as authoritative will have lower BMI scores than participants who perceive their parents as authoritarian or permissive*, again multiple analyses were utilized. Spearman's rank-order correlations were utilized to assess the relationship between participants' overall score for each parenting style, as obtained from their answers to the PAQ, and their BMI. This allowed for participants' BMI to be

assessed in relation to the degree with which they perceived each parenting style. Results of this analysis are provided in Table 6 and indicate that as perceived authoritarian parenting increased, participants' BMI also increased ($r_s = .14, p = .04$), demonstrating a positive correlation between these variables. This finding is illustrated in Figure 4. Alternatively, although the results of the correlation indicate that BMI was inversely to related authoritative ($r_s = -.03, p = .67$) and permissive ($r_s = -.01, p = .93$) parenting styles, these relationships failed to reach statistical significance. Therefore, the results of these correlations infer that authoritarian parenting was the only parenting style significantly correlated with BMI.

Table 6: Spearman's Correlation Matrix between Parenting Style and BMI

	Permissive $N = 227$	Authoritarian $N = 227$	Authoritative $N = 227$
	r_s (p)	r_s (p)	r_s (p)
BMI	-.01 ($p = .93$)	.14* ($p = .04$)	-.03 ($p = .67$)

Note. * $p < 0.05$, two-tailed

When analyzing the relationship between participants' BMI with respect to parenting style groups, a linear regression with dummy variables was utilized. Authoritative parenting was not included in the analysis and is therefore the reference, or comparison, variable. Results of this test are available in Table 7 and again indicate that those participants who perceived their parents to be authoritarian had a significantly higher average BMI when compared to participants who perceived their parents to be authoritative ($B = 1.50, t(223) = 2.05, p = .04$). It

is interesting to note that the results indicate that participants in the permissive parenting style group did have a higher mean BMI score when compared to participants in the authoritative parenting group; however, this difference did not reach statistical significance. Therefore, these results indicate that participants who perceived predominantly authoritative parenting had the lowest mean BMI scores across all parenting style groups.

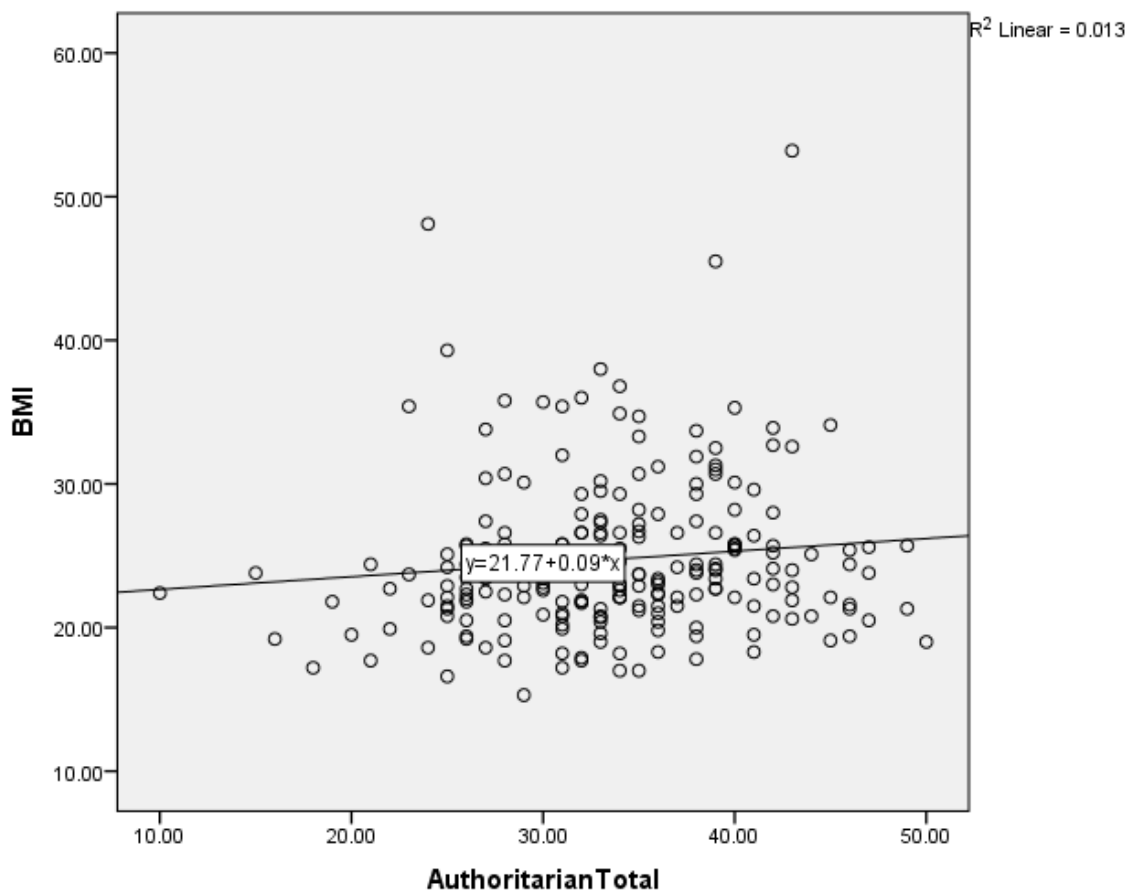


Figure 4: Scatterplot of participants' BMI and level of perceived authoritarian parenting where R^2 measures the strength of the association.

Table 7: Linear Regression of the Relationship between Parenting Style and BMI

	<i>B</i> Coefficient	Standard Error	<i>t</i> -statistic	<i>p</i> -value
Permissive	1.27	1.49	.85	.40
Authoritarian	1.50	.73	2.05	.04*

Note. * $p < 0.05$, two-tailed. ** $p < 0.01$, two-tailed.

The results of the final analysis conducted with respect to H₂ are demonstrated in Table 8. When categorizing participants based on the median split for each parenting style, independent sample t-tests were utilized to assess the mean difference in BMI scores between groups.

Table 8: Analysis of the Relationship between Parental Authority and BMI

	High	Low	<i>t</i> -statistic	<i>p</i> -value
	<i>M</i> ± <i>SD</i> (<i>n</i>)	<i>M</i> ± <i>SD</i> (<i>n</i>)		
Permissive	24.78 ± 5.63 (<i>n</i> = 131)	24.69 ± 5.08 (<i>n</i> = 96)	-.123	.90
Authoritarian	25.30 ± 5.50 (<i>n</i> = 126)	24.04 ± 5.18 (<i>n</i> = 100)	-1.76	.08
Authoritative	24.70 ± 5.25 (<i>n</i> = 128)	24.80 ± 5.59 (<i>n</i> = 99)	.135	.89

Based on this categorization of participants' perceived parenting style, no significant relationships were identified between parenting style and participant BMI. Again, it is important to interpret the results provided in Tables 7 and 8 with caution as analyses were conducted utilizing dichotomized continuous data.

Post-Hoc Analysis

Table 9 outlines the results of the nonparametric Mann-Whitney U test and demonstrates the differences in perceived parenting styles with respect to participants' demographic information. The results of the nonparametric test showed several significant correlations with respect to ethnicity. Caucasian participants were found to report significantly higher perceived authoritative parenting ($Z = -2.39, p = .02$) and significantly lower perceived authoritarian parenting ($Z = -2.69, p < .01$), as compared to participants who were not Caucasian. Alternatively, participants who self-identified with African American ethnicity were found to report significantly higher authoritarian parenting ($Z = -3.87, p < .01$) as compared to participants who did not self-identify as African American. Lastly with respect to ethnicity, participants who identified with an "other" ethnicity reported significantly higher perceived authoritative parenting ($Z = -2.22, p = .03$). However, no insight was available as to the ethnicity in which these individuals self-identified. An additional significant finding with respect to participant demographic information indicated that participants who were in their junior year of college reported significantly lower perceived authoritarian parenting ($Z = -2.02, p = .04$) than participants in all other years of their collegiate career.

Table 9: Nonparametric Test for Differences in Parenting Style across Demographic Variables

Characteristics	Permissive		Authoritarian		Authoritative	
	Z	p	Z	p	Z	p
Ethnicity						
Caucasian	-1.13	.26	-2.69**	<.01	-2.39*	.02
Hispanic / Latino	-1.12	.26	-.11	.92	-1.95	.05
African American	-.70	.48	-3.87**	<.01	-1.48	.14
Asian	-.77	.44	-.13	.89	-1.65	.10
Native American	-.37	.71	-.71	.48	-.17	.87
Other	-1.46	.15	-.22	.83	-2.22	.03
Birth Order						
Oldest	-.97	.33	-.51	.61	-.71	.48
Youngest	-1.39	.17	-.89	.37	-.35	.72
Middle	-.39	.70	-1.50	.13	-1.15	.25
Age Group						
18-20 yrs	-1.11	.27	-1.74	.08	-.39	.70
21-24 yrs	-.77	.44	-1.16	.25	-1.24	.22
25+ yrs	-.82	.41	-1.37	.17	-1.53	.13
Year in School						
Freshman	-1.19	.23	-1.35	.18	-.99	.32
Sophomore	-.24	.81	-.82	.41	-.14	.15
Junior	-1.10	.27	-2.02*	.04	-.75	.45
Senior	-.99	.32	-.65	.52	-1.10	.27
Gender						
Gender	-1.59	.11	-1.51	.13	-.62	.54

Note. * $p < 0.05$, two-tailed. ** $p < 0.01$, two-tailed.

Post-hoc analysis of differences in mean self-efficacy scores across each item in the instrument was conducted with respect to parenting style, again utilizing multiple statistical analyses. Spearman's rank-order correlations assessed participants' self-efficacy with respect to each parenting style and identified several significant relationships. The results demonstrated significant positive correlations between level of perceived authoritative parenting and participants' self-efficacy to eat extra vegetables with dinner ($r = .13, p = .04$), to eat fruits and vegetables when they are tired ($r = .16, p = .02$), in a rush ($r = .16, p = .02$), when their favorites are unavailable ($r = .15, p = .02$), with lunch most days ($r = .21, p < .01$), when away from home ($r = .15, p = .03$), and to eat at least five servings of fruit and vegetables most days ($r = .17, p = .01$). Level of perceived authoritarian parenting was also found to be significantly positively correlated with participants' self-efficacy to eat extra vegetables with dinner ($r = .14, p = .03$), to eat fruit and vegetables when tired ($r = .15, p = .03$), when at a restaurant ($r = .15, p = .02$), and with lunch most days ($r = .13, p = .04$). Lastly, level of perceived permissive parenting was found to be significantly negatively correlated with participants' self-efficacy to consume extra vegetables with dinner ($r = -.13, p = .04$). Table 10 shows a summary of these results.

Additionally, when utilizing the median split to categorize participants with respect to each parenting style, several significant results were again identified. The results of independent sample t-tests identified significantly higher self-efficacy for fruit and vegetable consumption when tired ($t(225) = -2.04, p = .04$), in a rush ($t(225) = -2.15, p = .03$), when favorites are unavailable ($t(225) = -2.35, p = .02$), at lunch ($t(225) = -2.93, p < .01$), when away from home ($t(225) = -2.45, p = .02$), and for eating five servings per day ($t(225) = -2.40$,

$p = .02$) among participants who perceived high authoritative parenting as compared to participants who perceived low authoritative parenting. Table 11 shows a summary of these results.

Results of independent sample t-tests comparing mean self-efficacy item scores between high and low perceived authoritarian parenting groups also identified numerous significant relationships. Perceived high authoritarian parenting was shown to be related with significantly increased self-efficacy to consume extra fruits and vegetables ($t(225) = -2.24, p = .03$) and to eat fruit and vegetables when tired ($t(225) = -2.06, p = .04$) and with lunch most days ($t(225) = -2.10, p < .04$). Table 12 shows a summary of these results. With respect to differences in mean self-efficacy across items based on perceived high and low permissive parenting, only one significant relationship was identified. Participants who reported perceiving high permissive parenting had significantly lower self-efficacy for consuming extra vegetables as compared to participants who reported low perceived permissive parenting ($t(225) = 2.65, p < .01$).

An ANOVA statistical analysis was utilized to test for differences in participants' mean self-efficacy scores with respect to each item in the survey instrument utilized an ANOVA. The results of this analysis identified no significant differences in mean self-efficacy scores across all items. For this analysis participants were categorized into the parenting style group with which they predominantly identified based on their responses to the PAQ. Again, participants who reported equal perceptions of multiple parenting styles were included in both parenting style groups for which they predominantly identified.

Table 10: Spearman Correlations between Self-Efficacy Item Scores and Parental Authorities

Self-Efficacy Items	Permissive (<i>n</i> =227)	Authoritarian (<i>n</i> =227)	Authoritative (<i>n</i> =227)
	<i>r_s</i> (<i>p</i>)	<i>r_s</i> (<i>p</i>)	<i>r_s</i> (<i>p</i>)
1. I can have extra vegetables at dinner.	-.13* (<i>p</i> = .04)	.14* (<i>p</i> = .03)	.13* (<i>p</i> = .04)
2. I can have some fruit or vegetables after a long day and I'm feeling tired.	-.08 (<i>p</i> = .26)	.15* (<i>p</i> = .03)	.16* (<i>p</i> = .02)
3. I can have some fruit or vegetables even on days when I'm in a rush.	-.08 (<i>p</i> = .26)	.06 (<i>p</i> = .34)	.16* (<i>p</i> = .02)
4. I can order at least one vegetable dish when eating at a restaurant.	-.08 (<i>p</i> = .26)	.15* (<i>p</i> = .02)	.12 (<i>p</i> = .08)
5. I can have a vegetable for dinner on most days.	-.04 (<i>p</i> = .52)	.07 (<i>p</i> = .31)	.09 (<i>p</i> = .20)
6. I can eat other fruits or vegetables when my favorite ones are unavailable.	-.04 (<i>p</i> = .54)	.07 (<i>p</i> = .30)	.15* (<i>p</i> = .02)
7. I can eat fruit as part of my lunch on most days.	-.06 (<i>p</i> = .35)	.13* (<i>p</i> = .04)	.21** (<i>p</i> < .01)
8. I can usually get a piece of fruit when I eat away from home.	-.03 (<i>p</i> = .70)	.11 (<i>p</i> = .09)	.15* (<i>p</i> = .03)
9. I can eat 5 servings of fruits and vegetables most days.	.02 (<i>p</i> = .75)	.044 (<i>p</i> = .56)	.17* (<i>p</i> = .01)

Note. * $p < 0.05$, two-tailed. ** $p < 0.01$, two-tailed.

Table 11: Mean Self-Efficacy Item Scores by Authoritative Parental Authority

Self-Efficacy Items	High Authoritative (<i>n</i> = 128) <i>M</i> ± <i>SD</i>	Low Authoritative (<i>n</i> = 99) <i>M</i> ± <i>SD</i>	<i>t</i> -statistic	<i>p</i> -value
1. I can have extra vegetables at dinner.	4.34 ± .99	4.08 ± 1.11	-1.82	(<i>p</i> = .07)
2. I can have some fruit or vegetables after a long day and I'm feeling tired.	4.27 ± 0.99	3.98 ± 1.12	-2.04*	(<i>p</i> = .04)
3. I can have some fruit or vegetables even on days when I'm in a rush.	3.98 ± 1.19	3.63 ± 1.24	-2.15*	(<i>p</i> = .03)
4. I can order at least one vegetable dish when eating at a restaurant.	4.05 ± 1.19	3.77 ± 1.27	-1.70	(<i>p</i> = .09)
5. I can have a vegetable for dinner on most days.	3.97 ± 1.19	3.83 ± 1.32	-.84	(<i>p</i> = .40)
6. I can eat other fruits or vegetables when my favorite ones are unavailable.	4.02 ± 1.17	3.64 ± 1.25	-2.35*	(<i>p</i> = .02)
7. I can eat fruit as part of my lunch on most days.	4.06 ± 1.14	3.60 ± 1.25	-2.93**	(<i>p</i> < .01)
8. I can usually get a piece of fruit when I eat away from home.	3.86 ± 1.16	3.47 ± 1.20	-2.45*	(<i>p</i> = .02)
9. I can eat 5 servings of fruits and vegetables most days.	2.94 ± 1.17	2.55 ± 1.16	-2.40*	(<i>p</i> = .02)

Note. * *p* < 0.05, two-tailed. ** *p* < 0.01, two-tailed.

Table 12: Mean Self-Efficacy Item Scores by Authoritarian Parental Authority

Self-Efficacy Items	High Authoritarian (<i>n</i> = 127) <i>M</i> ± <i>SD</i>	Low Authoritarian (<i>n</i> = 100) <i>M</i> ± <i>SD</i>	<i>t</i> -statistic	<i>p</i> -value
1. I can have extra vegetables at dinner.	4.36 ± .93	4.05 ± 1.17	-2.24*	(<i>p</i> = .03)
2. I can have some fruit or vegetables after a long day and I'm feeling tired.	4.27 ± 1.00	3.98 ± 1.10	-2.06*	(<i>p</i> = .04)
3. I can have some fruit or vegetables even on days when I'm in a rush.	3.91 ± 1.19	3.72 ± 1.26	-1.13	(<i>p</i> = .26)
4. I can order at least one vegetable dish when eating at a restaurant.	4.06 ± 1.21	3.76 ± 1.24	-1.80	(<i>p</i> = .07)
5. I can have a vegetable for dinner on most days.	3.95 ± 1.27	3.85 ± 1.22	-.62	(<i>p</i> = .54)
6. I can eat other fruits or vegetables when my favorite ones are unavailable.	3.93 ± 1.17	3.74 ± 1.27	-1.21	(<i>p</i> = .23)
7. I can eat fruit as part of my lunch on most days.	4.01 ± 1.17	3.67 ± 1.23	-2.10*	(<i>p</i> = .04)
8. I can usually get a piece of fruit when I eat away from home.	3.78 ± 1.22	3.58 ± 1.14	-1.26	(<i>p</i> = .21)
9. I can eat 5 servings of fruits and vegetables most days.	2.83 ± 1.21	2.69 ± 1.27	-.83	(<i>p</i> = .41)

Note. * *p* < 0.05, two-tailed

Post-hoc analysis also examined the relationship between participants' self-efficacy for fruit and vegetable consumption and their BMI. This relationship was assessed through computation of a Spearman's rank-order correlation coefficient. There was no significant correlational relationship identified between the two variables ($r_s = -.07, p = .31$). This finding is illustrated by the scatterplot in Figure 5.

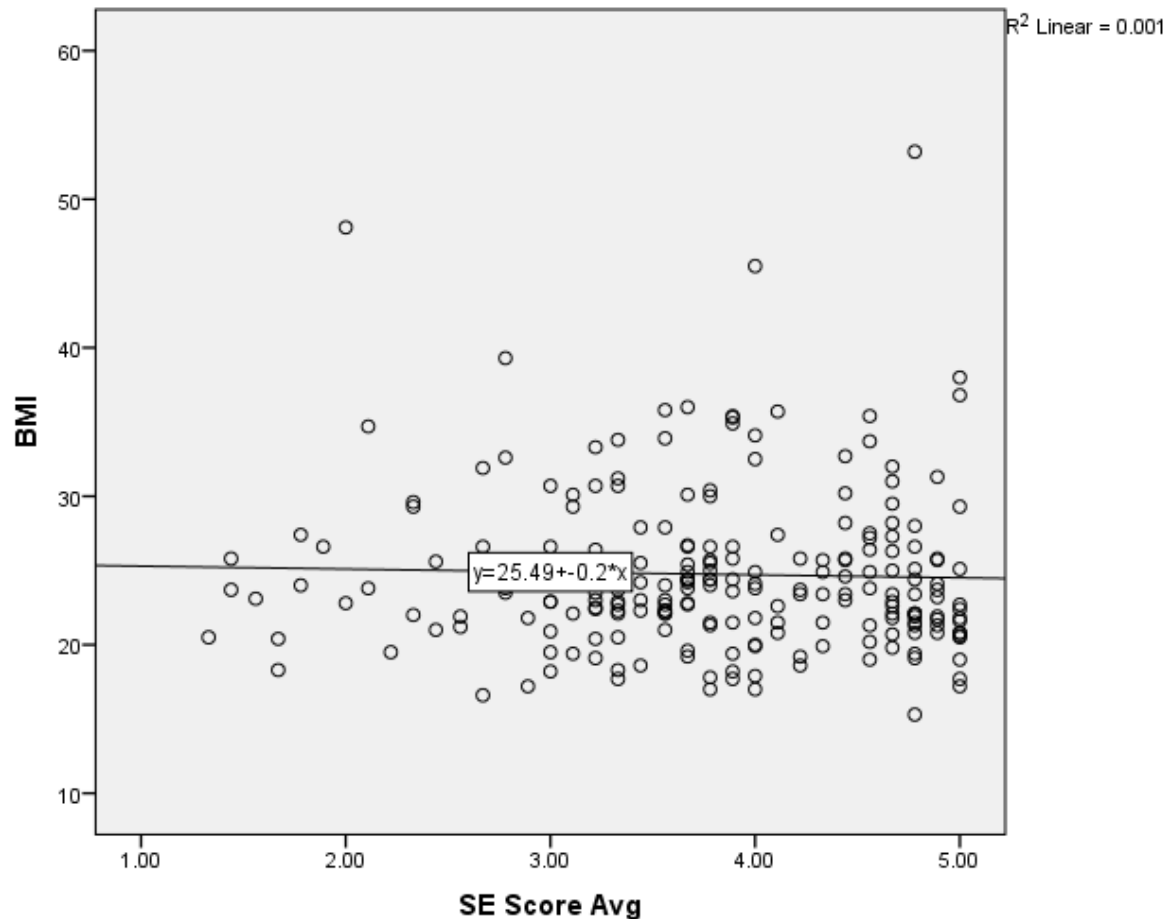


Figure 5: Scatterplot of participants' average self-efficacy for fruit and vegetable consumption and BMI where R^2 measures the strength of the association.

Similarly, insight into the relationship between family meal frequency and participant BMI was obtained through utilization of a Pearson product-moment correlation. The results of this correlation indicate a significant negative relationship between family meal frequency and participant BMI ($r = -.213, p < .01$). This finding is illustrated by the scatterplot in Figure 6.

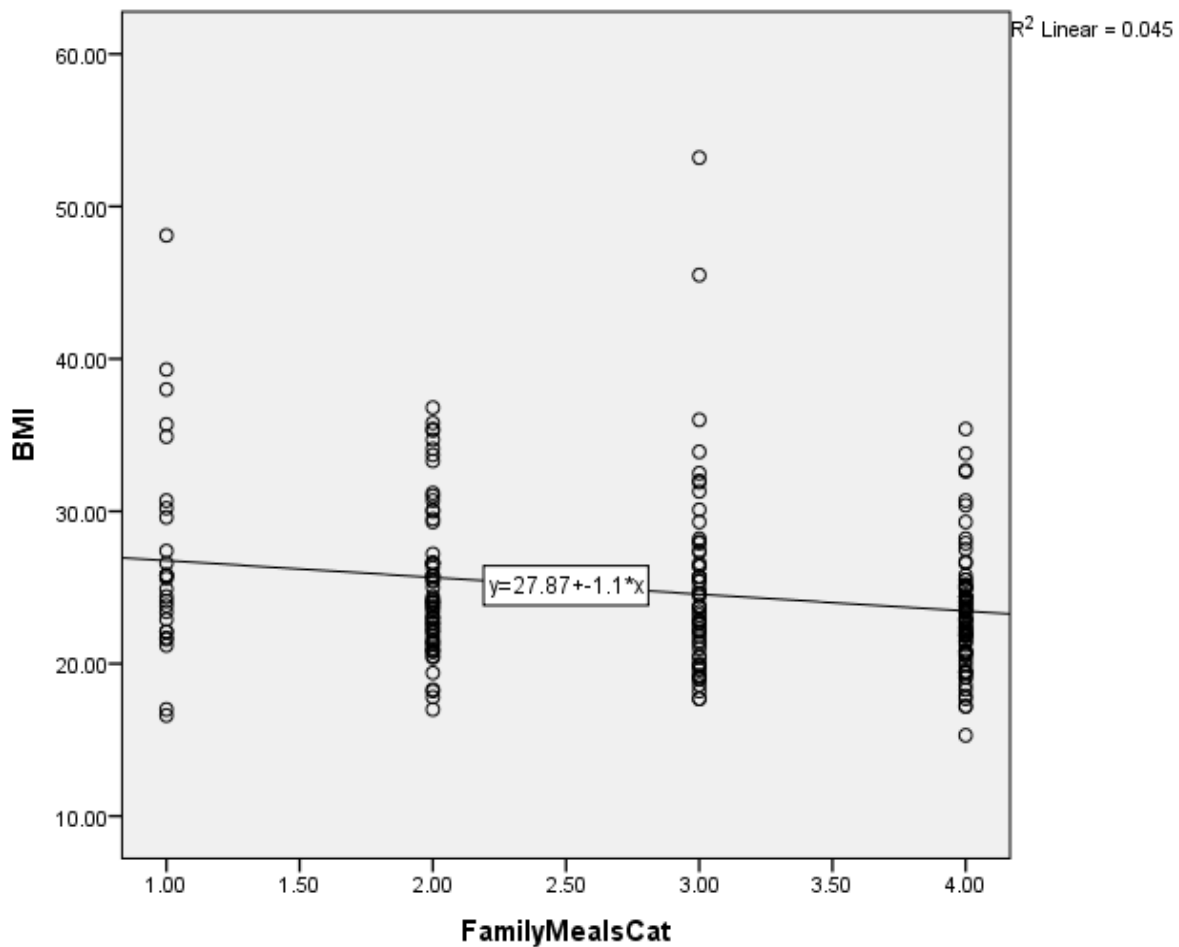


Figure 6: Scatterplot of participants' average BMI and family meal frequency where R^2 measures the strength of the association.

Lastly, the relationship between family meal frequency and perceived parenting style was assessed utilizing Spearman's rank-order correlations. The findings of the correlational data indicate a statistically significant positive relationship between family meal frequency and authoritative parenting ($r_s = .22, p < .01$) and a statistically significant negative relationship between family meal frequency and permissive parenting ($r_s = -.21, p < .01$). Table 13 demonstrates these findings.

Table 13: Spearman's Correlation Matrix between Parenting Style and Family Meal Frequency

	Permissive $N = 227$ r_s (p)	Authoritarian $N = 227$ r_s (p)	Authoritative $N = 227$ r_s (p)
Family meal frequency	-.21** ($p < .01$)	-.09 ($p = .18$)	.22** ($p < .01$)

Note. * $p < 0.05$, two-tailed. ** $p < 0.01$, two-tailed.

CHAPTER 4

DISCUSSION AND CONCLUSION

The purpose of this study was to evaluate the associations between perceived parenting style and self-efficacy for fruit and vegetable consumption as well as weight status among university students living in on-campus housing. The theory of planned behavior (TPB) developed by Icek Ajzen served as the foundation of this research study (31). The TPB demonstrates how attitude, subjective norms, and perceived behavioral control influence an individual's intention to perform a behavior, and how that intention translates into actual behavioral performance (31, 32). Parenting style is a stable characteristic of a parent that establishes the environmental and emotional framework by which they raise their children (3). Parental demandingness, one of the primary tenets by which parenting style is determined, is related to the pressure parents place on their children to adopt familial norms and the amount of control they exert over their children (4, 13). Therefore, the manner in which one is parented may influence their subjective norms and perceived behavioral control associated with a behavior. The concept of perceived behavioral control is rooted in self-efficacy theory, as it is related to the ease or difficulty with which an individual believes they can perform a specific behavior (31). Therefore, the TPB may provide a framework by which the relationship between parenting style and self-efficacy for fruit and vegetable consumption may be explained.

Ample evidence has demonstrated that authoritative parenting is associated with more positive outcomes such as superior emotional regulation, healthier dietary intake, and lower incidence of childhood overweight and obesity, as compared to authoritarian and permissive parenting styles (3, 7, 11, 13-14, 33-35). Therefore, the aim of this study was to assess whether established parenting styles remembered from childhood predicted self-efficacy for fruit and vegetable consumption and/or weight status of college students.

With respect to participant demographic variables, the literature shows that authoritative parenting is more typical of Caucasians and authoritarian parenting tends to be more common among African Americans and Hispanics. Asian parents are thought to be unique in that early in their child's life they typically display a permissive parenting style, but shift to a more authoritarian style as their child ages (7). However, these associations between parenting style and ethnicity may be confounded by social economic status (SES), as those parents of higher SES tend to be more authoritative than authoritarian across ethnic groups (36). While this study did not assess participant SES, the characteristics of the participants in this study did coincide with the aforementioned relationship between parenting style and ethnicity, as Caucasian ethnicity was found to be positively associated with authoritative parenting and negatively associated with authoritarian parenting. Furthermore, African American ethnicity was found to be positively associated with authoritarian parenting and participants who identified with another ethnic group other than those provided reported greater perceived authoritative parenting. Unfortunately, additional information regarding the ethnicity in which these participants self-identify was unavailable. This study population was predominantly Caucasian, however the ethnic breakdown of participants in this study is similar to the ethnic breakdown of

the student population from which data was collected, where 60.2% of students are Caucasian, 17% are African American, 13.2% are Hispanic/Latino, and 4.9% are Asian (37).

Overall, the results of this study demonstrated mixed findings with respect to the relationship between participants' perceived parenting style and the outcome variables, self-efficacy for fruit and vegetable consumption and BMI. The variation in the study outcomes is the result of the utilization of different interpretations of participants' perceived parenting style and methods of analysis. Participants' perceived parenting style as reported in their responses to the PAQ could be analyzed multiple ways. First, participants' perceived parenting style could be assessed with respect to each parental authority typology along a continuous scale. This method of analysis allowed for each participant to be assessed based on the degree to which they perceived each of the three parenting styles. Second, participants' perceived parenting style could be identified based upon which parenting style they scored the highest, and therefore classified into one of three parenting style groups. Alternatively, each participant's scores could be dichotomized to fit into 'high' or 'low' groups with respect to each parenting style based upon the median split. The different categorizations of participants into the respective parenting styles resulted in substantially different results of the hypothesis testing, and therefore allows for dramatically different conclusions to be drawn. Therefore, conclusions inferred from the results of this study must be addressed in terms of the method of participant categorization and data analysis.

Parental authority is commonly described in terms of permissiveness, authoritarianism and authoritativeness, and is based on the concepts of parental responsiveness and demandingness (4). While one parenting style, or parental authority, may be most predominant,

parents demonstrate some level of all three parental authorities. To our knowledge, this study is the first to assess the relationship between remembered parenting style and self-efficacy for fruit and vegetable consumption among an adult population. The findings of this study revealed a statistically significant positive relationship between perceived authoritative parenting and self-efficacy for fruit and vegetable consumption. However, the correlation coefficient ($r_s = .19$) indicates that this is a weak relationship and causation cannot be inferred when analyzing correlational data.

Similar findings were shown when categorizing participants based upon the median split for each parenting style. Participants who perceived high authoritative parenting were found to have significantly higher average self-efficacy for fruit and vegetable consumption as compared to those who perceived low authoritative parenting. Categorization of participants into 'high' and 'low' authoritative parenting groups was accomplished through the use of the median split. Using this method, all participants who scored above the median were considered to perceive high authoritative parenting and all those who scored below the median were considered to perceive low authoritative parenting. While this is a technique that has been demonstrated in the literature with respect to the PAQ (9), it is not without limitations. Risks associated with dichotomization of continuous variables include loss of information about individual differences, loss of measure reliability, increased chance of identifying false relationships, and decreased effect size and power (38). The effect size of this analysis is small, as indicated by $r = .18$. Therefore, although the analysis identified a statistically significant difference in mean self-efficacy scores between the high and low authoritative parenting groups, the magnitude of the relationship between the variables is small. Due to the small effect

size, it is with hesitation that inferences can be drawn from this relationship which indicates that authoritative parenting practices employed during child rearing years may result in increased self-efficacy for fruit and vegetable consumption among college-aged students who live away from home in on-campus housing.

Conversely when categorizing participants based upon the parenting style they perceived their caregiver to demonstrate most predominantly, there was no statistically significant relationship in mean self-efficacy for fruit and vegetable consumption identified across parenting styles. However, it is important to note the vast difference in sample sizes between parenting style groups and to acknowledge that this method of categorization resulted in dichotomization of a continuous variable. Therefore, the failed identification of statistically significant results utilizing this method of analysis is in disagreement with the results of the alternative methods of analysis and may be an indication of downfall of dichotomizing continuous variables.

With respect to individual questions on the self-efficacy scale, several significant relationships were identified with respect to perceived parenting style. When participants' self-efficacy for fruit and vegetable consumption was assessed in relationship to the degree in which they perceived each of the three parenting styles, as perceived authoritative parenting increased self-efficacy also increased for seven of the nine survey items. Increased authoritative parenting was associated with increased self-efficacy for consuming five servings of fruits and vegetables most days, for eating extra vegetables, and for eating fruits and vegetables when tired, when in a rush, when favorites were unavailable, and when away from home. Similar results were found when categorizing participants based on the median split. For this method of categorization,

those participants who perceived high authoritative parenting had increased self-efficacy for all of the aforementioned scenarios except for consumption of extra vegetables. With respect to authoritarian parenting, correlational data identified a positive relationship with self-efficacy for consumption of extra vegetables and for eating fruits and vegetables when tired, when at a restaurant, and with lunch most days. Again, similar results were found once participants were classified as perceiving ‘high’ or ‘low’ authoritarian parenting. This method of classification indicated increased self-efficacy for consuming extra vegetables and for eating fruits and vegetables when tired and with lunch most days. For permissive parenting, both increased perception of permissive parenting and perceived ‘high’ permissive parenting were found to be significantly negatively associated with self-efficacy to consume extra vegetables. However, permissive parenting was not found to be significantly related to any other items of the self-efficacy survey instrument. When classifying participants based on the parenting style in which they predominantly perceived their caregivers to demonstrate, no significant relationships were identified.

While these results must be interpreted with caution due to the dangers of utilizing median splits to dichotomize variables, the significant relationships identified between parenting style and self-efficacy for fruit and vegetable consumption in challenging situations indicate that remembered authoritative parenting may result in increased ability to overcome barriers associated with healthful eating. A study aimed at increasing self-efficacy for fruit and vegetable consumption conducted by Kreausukon et al. concluded that coping planning may be predictive of fruit and vegetable intake among university students. In this study, coping planning consisted of participants imagining situations in which barriers may arise that could

hinder their ability to consume fruits and vegetables and then identifying strategies to overcome these obstacles. Results of this study indicated that both coping planning and self-efficacy may be predictive of actual fruit and vegetable consumption among university students (2).

Additionally, with respect to coping among Korean college students, authoritative parenting has been found to be positively associated with adaptive coping (39). Therefore, future studies including an added component assessing college students coping abilities may help further explain the relationship between self-efficacy for fruit and vegetable consumption and parenting style.

Self-efficacy, as defined by Dr. Albert Bandura, is the confidence an individual has in their ability to execute a behavior that will lead to a desired outcome (21). Therefore, self-efficacy is measured in terms of perceived capability but does not measure the extent to which a behavior is truly executed. Despite this limitation, self-efficacy has been a highly studied psychological correlate and it has been shown to help bridge the knowledge-behavior gap with respect to health behavior change, specifically for fruit and vegetable consumption (2).

Additionally, research has shown that interventions aimed at increasing participant self-efficacy for fruit and vegetable consumption have been paralleled by increased fruit and vegetable intake, therefore indicating that self-efficacy is a good predictor of behavior (23). Perhaps measuring participants' fruit and vegetable intake in addition to their self-efficacy may have provided more insight into the relationship between their perceived parenting style and their dietary intake and allowed for further conclusions to be drawn about the healthfulness of college students' intake across parenting styles.

The second objective of this study was to identify the relationship between perceived parenting style and participant BMI. Again this relationship was assessed utilizing multiple methods of participant categorization and statistical analysis. Correlational data identified a significant positive relationship between perceived authoritarian parenting and BMI ($r_s = .14, p = .04$). Additionally, when categorizing participants based on the predominant parenting style they remember as indicated by their responses to the PAQ, participants who remembered predominantly authoritarian parenting had a significantly higher average BMI when compared to participants who perceived their parents to be authoritative ($B = 1.50, t(223) = 2.05, p = .04$). However, due to the large range of BMI scores across all levels of perceived authoritarian parenting, the effect size of this analysis is small and perceived authoritarian parenting only accounts for 2% of the variance in BMI scores. In opposition, after dichotomizing participants into 'high' and 'low' categories based on authoritative parenting, there were no significant relationships identified between perceived parenting style and participant BMI. This discrepancy in outcomes may be related to the practice of dichotomizing continuous data which can result in loss of information and decreased reliability (38).

Other researchers have also explored weight status with respect to parenting style and indicated that children raised by authoritarian and permissive parents are significantly more likely to be overweight or obese (3). Additionally, childhood overweight and obesity has been found to be significantly related to later-life incidence of overweight and obesity, indicating that overweight and obese children tend to remain overweight and obese as adults (16, 17). Conversely, authoritative parenting has been shown to be associated with lower risk of childhood overweight and obesity (3, 19). Therefore, the results of this study add to the body of

literature regarding the relationship between perceived parenting style and weight status and imply that remembered authoritarian parenting is associated with higher BMI and increased risk for overweight and obesity.

Post-hoc analysis of the relationship between participant BMI and self-efficacy for fruit and vegetable consumption was found to be insignificant. Although self-efficacy has been shown to be a strong predictor of actual fruit and vegetable intake (19), perhaps among this population, self-efficacy did not translate into behavior. Since no quantitative measure of fruit and vegetable intake was obtained, no insight is available into the relationship between self-efficacy and fruit and vegetable intake among the study participants. Additionally, the majority of participants in this study were freshmen ($N = 125$, 55.1%) and all participants lived on campus. During the first year of college weight gain is common, and students living on campus have been found to gain more weight than students living off campus (40). Therefore, this is another possible explanation for the lack of a significant relationship between participant self-efficacy and BMI. Lastly, a systematic review of the literature regarding this association found that high fruit and vegetable intake was weakly associated with weight loss among overweight and obese adults and longitudinally associated with less or slower weight gain among adults (41). However, it is difficult to draw conclusions between fruit and vegetable intake weight due to the numerous potential confounding variables, such as total dietary intake and physical activity level. Therefore, addition of a quantitative measurement of participants' fruit and vegetable intake may allow for further insight into the relationship between parenting style and weight status with respect to dietary intake.

Research has demonstrated a relationship between family meal frequency and decreased risk of overweight and obesity among high school adolescents (42). Correlational data obtained in this study adds to the literature through identification of a significant relationship between family meal frequency and BMI among a study population consisting of young-adult, college students. This finding indicates that more frequent family meals are associated with lower BMI among all participants, regardless of perceived parenting style. However, with respect to parenting style, perceived authoritative parenting was found to be significantly positively correlated with family meal frequency. Alternatively, perceived permissive parenting was found to be significantly negatively correlated with family meal frequency. It is important to note that these findings are based solely on correlational data and therefore causation cannot be inferred. Nevertheless, these results indicate that increased family meal frequency may be one of the factors mediating the relationship between parenting style and risk for overweight and obesity. The relationship between family meal frequency and decreased risk of overweight and obesity is potentially related to the improved dietary quality of individuals who consume more frequent family meals that has been well documented in the literature (13, 34, 43). Therefore, further studies are warranted to assess the factors mediating the relationship between family meal frequency and perceived parenting style.

Implications

To our knowledge, this is the first study to examine the relationship between remembered parenting style and self-efficacy for fruit and vegetable intake among an adult

population. Therefore, this study contributed to the body of knowledge examining the long-term impacts of remembered parenting styles. Results of this study expand our knowledge regarding the relationships between parenting style and self-efficacy for fruit and vegetable consumption and weight status. Research shows that college years are a critical time period that often shapes later life health behaviors, such as dietary intake (1, 2). In relation to later-life outcomes, adequate fruit and vegetable consumption has been shown to be related to lower risk of chronic diseases, such as cardiovascular disease and cancer (1, 2). Additionally, fruit and vegetable consumption has been shown to be a predictor of overall dietary quality (15) and self-efficacy for fruit and vegetable consumption has been found to be a strong predictor of actual fruit and vegetable intake (1, 2, 15, 23-25). Numerous studies have indicated an improved dietary quality and decreased risk for overweight and obesity among children with authoritative parents (13, 34, 42-43). The results of this study identified a significant positive relationship between authoritative parenting and self-efficacy for fruit and vegetable consumption, as well as a significant positive relationship between authoritarian parenting and BMI. Therefore, based on the aforementioned results, some suggestions may be made for clinicians. When working with parents, education regarding infant, child, and adolescent feeding should be expanded to include teaching concerning the use of authoritative feeding practices in addition to instruction on the appropriate types and quantities of foods provided. Continued education throughout the life course could help parents and their children develop healthful dietary habits and a supportive feeding environment.

Further work should explore the relationship between parenting style with respect to SES and the challenges that are faced across a variety of economic backgrounds. Among low-

income families, authoritarian attitudes and feeding practices such as clean-plate rules may be utilized due to food insecurity. Therefore, since parenting style has been shown to be related to SES (36), assessment of the barriers these parents face and identification of potential coping mechanisms may allow for employment of more favorable, authoritative parenting practices with respect to dietary intake.

Psychological research has indicated that college students who perceived their parents to be authoritative demonstrate adaptive coping skills (39) and that coping planning has been associated with increased fruit and vegetable intake (2). Therefore, perhaps established coping skills are responsible for mediating the relationship between perceived authoritative parenting and self-efficacy for fruit and vegetable consumption when faced with challenges. Further research is needed in order to examine appropriate coping mechanisms with respect to dietary intake so that clinicians may be able to work with parents and adolescents to establish appropriate coping strategies.

Limitations

There are several limitations that should be considered when interpreting the results of this study. First, the study failed to obtain a sufficient population sample size for the data to be considered representative of the population. Based on Krejcie and Morgan's published table for determining sample size from a given population, the target sample size for this study was 350 participants (29). However, a total of 227 complete survey responses were obtained, therefore meeting just 64% of the target population. Additionally, within the study population, when

participants were classified based on the parenting style they predominantly perceived, they were not evenly distributed among the parenting style groups. Therefore, this limits the power of the results obtained from those analyses. The timing in which the study was conducted is another potential factor that may have impacted study participation. This study was conducted during the last weeks of a semester during which time final exams were taking place.

Therefore, it is possible that better study participation may have been obtained if the study were to be conducted at a different point in the academic semester. Additionally, although utilizing online surveys is advantageous in terms of time and money savings, it is possible that some potential participants were missed due to failure to receive or check e-mails. Additionally, the response rates to paper surveys have been shown to almost always be superior to the response rates of online surveys (44). Therefore, better study participation may have been obtained if data collection was extended to include a physical presence in on-campus residence halls.

Another limitation of this study was the survey instrument utilized. According to Dr. Albert Bandura, a lead researcher in the area of self-efficacy, scales used for assessing self-efficacy should use a response format with a wide range, such as 0-100, rather than a smaller range, such as the 5-interval scale employed in this study (45). When smaller scales are used, scores are less sensitive predictors of performance as people tend to avoid the extreme positions. When analyzing the results of this study, consideration was given to categorizing participants as having either high or low self-efficacy based on a set cut-point. However, Bandura warns that dichotomizing a continuous variable may result in decreased predictive value as those individuals with moderate self-efficacy may inaccurately be classified as having complete self-assurance or totally lacking self-efficacy based upon the established cut-off point.

Therefore, perhaps using a self-efficacy measure with a wider scaled response format may have allowed for more accurate representation of participants' self-efficacy for fruit and vegetable consumption (45).

As stated above, use of online surveys allows for both time and cost savings, especially when attempting to obtain a large sample size in a small time frame. Additionally, it allows for completely anonymous participation and tends to result in less social desirability response bias than surveys administered over the phone or in person. However, online surveys also have their downfalls. In addition to the chance of e-mailed surveys being filtered into spam, there is also the alternative problem of e-mail survey overload as participants may be frequently receiving a variety of online survey requests. Furthermore, the use of online surveys has the potential to result in coverage bias if all individuals within the target population are not given adequate opportunity or assistance to complete the study. Therefore, issues such as limited internet access, visual and/or learning disabilities, and language barriers may have impaired the ability of certain members of the target population to complete the online survey (46).

An additional potential limitation of this study is the high amount of researcher handling that was necessary prior to data analysis. A flaw in the questionnaire design resulted in all exported data being reported qualitatively which then had to be recoded into quantitative data. Additionally, computation was necessary to identify participants' predominantly perceived parenting style and average self-efficacy. Transcription of the data was largely accomplished through automated coding utilizing both Excel and SPSS functions. However, additional manual coding was required as well. Therefore, although the likelihood of errors

related to recoding is low due to the principal use of automated coding, it is possible that some data may have been recoded erroneously and therefore analyzed incorrectly (47).

Lastly, the survey utilized in this study asked participants to think back to their formative years when being raised at home and to provide self-report data. Therefore, assessment of parenting style was based on pre-formed perceptions from the past which for some participants required recollection of situational information from more than a decade prior. Additionally, the assessment of parenting style did not account at all for the caregivers' perception of their parenting style. However, research has demonstrated that parents, or caregivers, and their children tend to be consistent in their rating of parenting style (9).

Conclusion

This study examined perceived parenting style with respect to its relationship with self-efficacy for fruit and vegetable consumption. Additionally, it surveyed the relationship between perceived parenting style and BMI. Both of these relationships were assessed utilizing a population of college students residing in on-campus housing. Conflicting results were found with respect to these relationships dependent upon the method of categorization utilized to classify participants' perceived parenting style. However, the findings indicate that remembered authoritative parenting during childhood years spent at home was associated with increased self-efficacy for fruit and vegetable consumption when faced with challenging situations. Additionally, among this population, perceived authoritarian parenting was found to be associated with significantly higher BMI. Post-hoc analysis resulted in identification of

additional significant findings with respect to family meal frequency. Family meal frequency was shown to be positively correlated with authoritative parenting, and negatively correlated with BMI. Thus, family meal frequency may be a factor influencing the relationship between perceived parenting style and weight status. The findings of this study imply that further research with respect to parenting style and dietary behaviors may provide additional insight into how healthful dietary habits may be established early in the life course with the opportunity to result in long-term positive health outcomes.

REFERENCES

1. Richards A, Kattelman KK, Ren C. Motivating 18- to 14-year olds to increase their fruit and vegetable consumption. *J Am Diet Assoc.* 2006;206z; 1405-1411.
2. Kreausukon P, Gellert P, Lippke S, Schwarzer R. Planning and self-efficacy can increase fruit and vegetable consumption: A randomized controlled trial. *J Behav Med.* 2012;35:443-451.
3. Rhee KE, Lumeng JC, Appugliese DF, Kaciroti N, Bradley RH. Parenting styles and overweight status in first grade. *Pediatrics.* 2006;117: 2047-2054.
4. Sartaj B, Aslam N. Role of authoritative and authoritarian parenting in home, health and emotional adjustment. *J Behav Sci.* 2010;20:47-66.
5. Baumrind D. Effects of authoritative parental control on child behavior. *Child Dev.* 1966;37: 887-907.
6. Williams KE, Ciarrochi J, Heaven PCL. Inflexible parents, inflexible kids: A 6-year longitudinal study of parenting style and the development of psychological flexibility in adolescents. *J Youth Adolescence.* 2012;41:1053-1066.
7. Rothrauff TC, Cooney TM, Shin An J. Remembered parenting styles and adjustment in middle and late adulthood. *J Gerontol B Psychol Sci Soc Sci.* 2009;64B(1):137-146.
8. Hubbs-Tait L, Kennedy TS, Page MC, Topham GL, Harrist AW. Parental feeding practices predict authoritative, authoritarian, and permissive parenting styles. *J Am Diet Assoc.* 2008;108:1154-1161.
9. Ferrari JR, Olivette MJ. Perceptions of parental control and the development of indecision among late adolescent females. *Adolescence.* 1993;28(112):963-970.
10. McKinney C, Milone MC, Renk K. Parenting and late adolescent emotional adjustment: Mediating effects of discipline and gender. *Child Psychiatry Hum Dev.* 2011;42:463-481.

11. Patrick H, Nicklas TA, Hughes SO, Morales M. The benefits of authoritative feeding style: Caregiver feeding styles and children's food consumption patterns. *Appetite*. 2005;44:243-249. Saxton J, Carnell S, Van Jaarsveld CHM., Wardle J. Maternal education is associated with feeding style. *J Am Diet Assoc*. 2009;109: 894-898.
12. Saxton J, Carnell S, Van Jaarsveld CHM., Wardle J. Maternal education is associated with feeding style. *J Am Diet Assoc*. 2009;109: 894-898.
13. Berge JM, Wall M, Neumark-Sztainer D, Larson N, Story M. Parenting style and family meals: Cross-sectional and 5-year longitudinal associations. *J Am Diet Assoc*. 2010;110:1036-1042.
14. Hennessy E, Hughes SO, Goldberg JP, Hyatt RR, Economos CD. Permissive parental feeding behavior is associated with an increase in intake of low-nutrient-dense foods among American children living in rural communities. *J Am Diet Assoc*. 2012;112: 142-148.
15. Annesi JJ. Self-regulatory skills usage strengthens the relations of self-efficacy for improved eating, exercise, and weight in the severely obese: Toward an explanatory model. *Behav Med*. 2011;37: 71-76.
16. Reilly JJ, Kelly J. Long-term impact of overweight and obesity in childhood and adolescence on morbidity and premature mortality in adulthood: Systematic review. *Int J Obesity*. 2011;35: 891-898.
17. Biro FM, Wien M. Childhood obesity and adult morbidities. *Am J Clin Nutr*. 2010;91: 1499S-1505S.
18. Rhee K. Childhood overweight and the relationship between parent behaviors, parenting style, and family functioning. *Ann Am Acad Polit Soc Sci*. 2008;615: 12-37.
19. Stang J, Loth, KA. Parenting style and child feeding practices: Potential mitigating factors in the etiology of childhood obesity. *J Am Diet Assoc*. 2011;111(9): 1301-1305.
20. Agliata AK, Renk K. College students' adjustment: The role of parent-college student expectation discrepancies and communication reciprocity. *J Youth Adolescence*. 2008;37:967-982.
21. Bandura A. Self-efficacy: Toward a unifying theory of behavioral change. *Psychol Rev*. 1977;84(2): 191-215.
22. Pearson N, Ball K, Crawford D. Parental influences on adolescent fruit consumption: The role of adolescent self-efficacy. *Health Edu Res*. 2012;27(1): 14-23.

23. Luszczynska A, Tryburcy M, Schwarzer R. Improving fruit and vegetable consumption: A self-efficacy intervention compared with a combined self-efficacy and planning intervention. *Health Edu Res.* 2007;22(5): 630-638.
24. Franko DL, Cousineau TM, Trant M, Green TC, Rancourt D, Thompson D, Ainscough J, Mintz LB, Ciccazzo M. Motivation, self-efficacy, physical activity and nutrition in college students: Randomized controlled trial of an internet-based education program. *Prev Med.* 2008;47: 369-377.
25. Melbye EL, Overby NC, Ogaard T. Child consumption of fruit and vegetables: The role of child cognitions and parental feeding practices. *Public Health Nutr.* 2011;15(6): 1047-1055.
26. Buri JR. Parental authority questionnaire. *J Pers Assess.* 1991;57(1):110-119.
27. Buri JR. Self-esteem and appraisals of parental behavior. *J Adolescent Res.* 1989;4(1):33-49.
28. Henry H, Reimer K, Smith C, Reicks M. Associations of decisional balance, processes of change, and self-efficacy with stages of change for increased fruit and vegetable intake among low-income, African American mothers. *J Am Diet Assoc.* 2006;106: 841-849.
29. Krejcie RV, Moran DW. Determining sample size for research activities. *Educ Psychol Meas.* 1970;30: 607-610.
30. IBM Corp. IBM SPSS Statistics for Windows. Version 21.0. Armonk, NY: IBM Corp; 2012.
31. Ajzen I. Theory of planned behavior. *Organ Behav Hum Dec.* 1991;50:179-211.
32. Niemeier BS, Hektner JM. Weight-related health behaviors and body mass: Associations between young adults and their parents, moderated by parental authority. *Am J Health Behav.* 2012;43(6): 366-377.
33. Baumrind D. Reciprocal rights and responsibilities in parent-child relations. *J Soc Issues.* 1978;34(2): 179-196.
34. Burgess-Champoux TL, Larson N, Neumark-Sztainer D, Hannan PJ, Story M. Are family meal patterns associated with overall diet quality during the transition from early to middle adolescence. *J Nutr Educ Behav.* 2009;41(2): 79-86.
35. Larson N, MacLehose R, Fulkerson JA, Berge JM, Story M, Neumark-Sztainer D. Eating breakfast and dinner together as a family: Associations with sociodemographic characteristics and implications for diet quality and weight status. *J Acad Nutr Diet.* 2013;113(2): 1601-1609.

36. Hoff E, Laursen B, Tardif T. Sociodemographic status and parenting. In: Bornstein MH, ed. *Handbook of Parenting Volume 2 Biology and Ecology and Parenting*. Mahwah, NJ: Lawrence Erlbaum Associated; 2002: 231-253.
37. Northern Illinois University. *Fast Facts*. 2013. Available at: <http://www.niu.edu/at-a-glance/fastfacts.shtml>. Accessed October 24, 2014.
38. MacCallum RC, Zhang S, Preacher KJ, Rucker DD. On the practice of dichotomization of quantitative variables. *Psychol Methods*. 2002;7(1): 19-40.
39. Hong SE. *Korean American college students' coping patterns in relation to academic stress, parenting style and acculturation* [dissertation]. Boston, MA: Northwestern University; 2013.
40. Vella-Zarb RA. Predicting the 'freshman 15': Environmental and psychological predictors of weight gain in first-year university students. *Perspect Public Health*. 2011;131: 217-224.
41. Ledoux TA, Hingle MD, Baranowski T. Relationship of fruit and vegetable intake with adiposity: A systematic review. *Obes Rev*. 2011;12(5): 143-150.
42. Fulkerson JA, Larson N, Horning M, Neumark-Sztainer D. A review of associations between family or shared meal frequency and dietary and weight status outcomes across the lifespan. *J Nutr Educ Behav*. 2014;46: 2-19.
43. Welsh EM, French SA, Wall M. Examining the relationship between family meal frequency and individual dietary intake: Does family cohesion play a role? *J Nutr Educ Behav*. 2011;43: 229-235.
44. Nulty DD. The adequacy of response rates to online and paper surveys: What can be done? *Assess Eval High Educ*. 2008;33(3): 301-314.
45. Bandura A. Guide for constructing self-efficacy scales. In: Pajares F, Urdan T, ed. *Self-Efficacy Beliefs and Adolescents*. Greenwich, CT: Age Publishing; 2006: 307-337.
46. Sue VM, Ritter LA. *Conducting Online Surveys*. 2nd ed. Thousand Oaks, CA: SAGE Publications; 2012:16-23.
47. Lyberg L, Biemer P, Collins M, de Leeuw E, Dippo C, Schwarz N, Trewin D. *Survey Measurement and Process Quality*. New York, NY: John Wiley & Sons, Inc; 1997:360-397.

APPENDIX A
REVIEW OF THE LITERATURE

LITERATURE REVIEW

Parenting style has been a topic of research for decades. The influence of parenting style is evident in both emotional and behavioral development, including the establishment of health behaviors related to nutritional intake. While parenting style has been shown to be related to emotional outcomes throughout the life course, research on the behavioral impact of parenting style with respect to nutritional intake is lacking past early childhood and adolescence. Research shows that college years are a critical time period that often shapes later life health behaviors, such as dietary intake (1, 2). Therefore, the purpose of this study is to examine the long-term impact of parenting style on self-efficacy for fruit and vegetable consumption among college-aged students living in on-campus housing.

Parenting style is considered to be a stable characteristic of a parent that establishes the environmental and emotional framework by which parents raise their children (3). Most commonly, parenting styles are characteristics based upon parental demandingness and responsiveness. Parental demandingness is the amount of control a parent exerts over their child; whereas responsiveness is the amount of support and warmth a parent provides their child (4). One of the premier researchers on parenting style, Dr. Baumrind, developed a parenting style framework based on these concepts. According to Baumrind's typology, parents adopt either an authoritarian, authoritative, or permissive parenting style (5). Authoritarian parents are described as displaying high demandingness and low responsiveness (4-8). Permissive parents display low demandingness and low responsiveness, and may be described

as either indulgent or neglectful (5, 7, 8). Lastly, authoritative parents display high demandingness and high responsiveness (4-8). Although there has been some variance in the literature, the authoritative parenting style has most commonly and consistently been identified as the ideal parenting style for promoting children's optimal development.

Authoritative parenting style has been shown in the literature to be related to many beneficial childhood, adolescence, and later-life outcomes, such as improved decision-making skills (4, 9), less depressive symptoms (7), better emotional adjustment (10), and improved psychological flexibility (6). However, parenting style has not been tied to emotional outcomes alone. Research has also demonstrated that there is a relationship between parenting style and dietary habits.

Beginning in childhood, parenting style has been shown to have an influence on parental feeding style (7, 11, 12). Similar to findings related to emotional adjustment, authoritative parenting has been found to be the ideal parenting style with regards to dietary intake (13). Authoritative parenting has been found to be correlated with more healthful dietary intake (13), including increased intake of dairy and vegetables (11), and decreased intake of low nutrient dense foods, fats, and oils (14).

Due to the increasing rate of childhood obesity in recent decades, researchers have also examined parenting style in relation to the child's weight status. Although studies have had conflicting findings, research has shown that children of authoritarian and permissive parents are more likely to be overweight or obese than children of authoritative parents (3, 15). The increased risk for overweight or obesity among these children is likely related to both cognitive

and behavioral impacts of parenting style. Parental feeding practices, parental behaviors, and parental influences not only mold child health behaviors, but also influence the development of attitudes and beliefs related to specific foods and eating habits (16).

Although the relationship between parenting style and weight status has been examined throughout childhood and adolescent years, there is a lack of literature examining this relationship in adulthood (15). College years are a time period characterized by increased independence and distance from parental controls; however, the parental relationship may still have a significant impact in the process of adjusting to adulthood (10, 17). Additionally, the health behaviors established during these years often have an impact on later-life health status (1, 2). Fruit and vegetable consumption is considered to be a vital component of a healthy diet, and has been shown to be related to lower risk of chronic diseases such as cardiovascular disease and cancer (2). Therefore, much research has been conducted in attempt to identify successful interventions targeting fruit and vegetable intake.

Self-efficacy, the confidence an individual has in their ability to execute a behavior, has perhaps been the most widely studied psychological correlate related to fruit and vegetable consumption (18). Numerous studies have identified a direct association between an individual's self-efficacy and their fruit and vegetable intake (1, 2, 19-22). However, there is a lack of literature examining the relationship between parenting style and self-efficacy for fruit and vegetable intake in the adult population. Therefore, the aim of this study is to evaluate the relationship between parenting style and self-efficacy for fruit and vegetable consumption among college-aged students living away from home.

Parental Demandingness and Responsiveness

There are many factors that influence one's development. Arguably one of the most influential factors is the manner in which one is parented. Parental demandingness and responsiveness are the foundation of parenting, and research has investigated the impact of parental characteristics on the development of later life cognitions, personality, and behaviors. Parenting style is not only related to childhood perception of self and the world; it is tied to numerous adolescent and adult outcomes as well (4, 7, 10).

Demandingness

Parental demandingness is the pressure parents put on children to adopt familial norms through behavioral supervision and discipline (4). Simply, it is the amount of control a parent exerts over their child. Appropriate parental demandingness can help cultivate self-control and responsibility in children (13). However, while appropriate use of control and punishment may be necessary and beneficial for child rearing, excessive control and severe or unreasonable punishment is harmful and unproductive (5). Therefore, children of highly demanding parents who employ aggressive, self-righteous punishment techniques often struggle with rebellion, aggression, withdrawal, acting out, dependency, nervousness, and personality problems. Conversely, proper use of control and punishment is associated with pro-social assertive behavior, lessening of guilt, resistance to similar deviant behavior, and development of the ability to tolerate punishment. Therefore, firm but reasonable, authoritative control is associated

with striving and aggressive, but not rebellious, children. Authoritative parents, who model control and punishment through legitimate and rational concerns for their child's well-being, have been shown to be well-accepted and emulated by their children. However, highly demanding, authoritarian parents, who express control due to personal need for dominance, are often rejected (5).

Responsiveness

Parental responsiveness is the extent to which parents encourage individuality and self-expression, and are available to tend to the needs and desires of their children (4). Simply, it is the amount of support a parent provides their child. For instance, an authoritarian parent may serve dinner and forbid their child from leaving the table until it has all been consumed, regardless of the child's hunger or desire to eat. Conversely, an authoritative parent may serve dinner and allow the child to choose the type and amount of food they would like to consume. Therefore, appropriate parental responsiveness, characterized by warmth and acceptance, nurtures self-regulation and assertion and positively influences child development (13).

Parenting Styles

Parenting style is considered to be a stable characteristic of a parent that establishes the environmental and emotional framework by which parents raise their children (3). According to

Baumrind, there are three models of parental control: authoritarian, authoritative, and permissive (5). Parenting style is assessed based on the balance between parental demandingness, or control, and parental responsiveness, or support/warmth.

Permissive

Permissive parents exhibit low demandingness and low responsiveness (5, 7, 8). They are characterized as avoidant of discipline, acceptant, and undemanding. They permit self-regulation, expressiveness, and impulsiveness, sometimes to the point of carelessness (5). These parents exert little control over their children, either through overly indulgent or neglectful parenting (23). Indulgent parents believe that setting minimal rules and expectations results in improved childhood behavior development, whereas uninvolved parents fail to connect at all with their children. Therefore, while indulgent parents have child-centered motivations, uninvolved or neglectful parents tend to have underlying parental psychopathology problems (7).

Authoritarian

Authoritarian parents exhibit high demandingness and low responsiveness (4-8). They are characterized as controlling, highly disciplinary, and restrictive of autonomy. They value order and structure and demand respect and obedience (5). Authoritarian parents have been

characterized as cold, unsupportive, and insensitive to the needs of their children (7). These parents tend to set strict rules which cannot be questioned, and they rarely explain why obedience is required. Through these practices, they maintain control of their child's behavior and prevent their children from learning from their mistakes. Therefore, children raised by authoritarian parents may be conditioned to believe that they are not responsible for or in control of what happens to them (4).

Authoritative

Authoritative parents exhibit high demandingness and high responsiveness (4-8, 10). They set boundaries, yet they can encourage open discussion and provide reasoning for their restrictions. They enforce their own rules, but consider their child's interests and qualities. Control is viewed as being shared between the environment, the parent, and the child, therefore balancing the importance of autonomy and self-will while also valuing discipline (24). Authoritative parenting embodies a balance of the more extreme permissive and authoritarian parenting styles.

Due to their impact on child development, parenting styles have been the focus of both cognitive and behavioral research studies for decades. Through these studies, much insight has been gained into the short- and long-term psychological and behavioral impacts of parenting style on child development.

Parenting Style and Emotional Regulation

Parents have considerable impact on a child's emotional development. One area in which research has identified a positive relationship between parenting and child outcomes is emotional regulation and adjustment (4). Emotional self-regulation is an important skill characteristic of psychologically healthy adults, however its development begins many years prior to adulthood (6). Throughout childhood and adolescence, individuals need to learn to work within their environments. By developing emotional regulation skills, individuals are better equipped to respond to both internal and external cues in order to produce an appropriate behavioral response (6). Therefore, in attempt to identify an optimal parenting style, researchers have investigated the relationship between parenting styles and development of emotional regulation skills at various stages of the life course.

Decisional procrastination, or indecision, is thought to be a maladaptive coping mechanism utilized when facing decision making experiences that are perceived to be stressful. In order to understand the relationship between decisional procrastination and perceived parental control, an early study was conducted by Ferrari and Olivette utilizing a population of female college students (9). Data collection consisted of 86 participants completing the Decisional Procrastination Scale and Parental Authority Questionnaire (25, 26). As hypothesized, perceived authoritarian parenting was correlated with participant indecision. However, perceived authoritative and permissive parenting styles were found to be unrelated to decisional procrastination scores. In accordance with findings of other studies utilizing the PAQ, the authoritarian parenting style leads to poor adolescent self-esteem (9, 27), which has

been shown to be related to decisional procrastination (9). Decisional procrastination is a coping mechanism used to deal with stressful decision-making situations, and may be a form of rebellion against demanding, authoritarian parents (9). Alternatively, research indicates that authoritative parenting results in self-assured, assertive children who do not need to rely on decisional-procrastination as a coping mechanism (24). Therefore, this study indicates that the development of decisional-procrastination in college-aged females is related to their earlier home life. However, conclusions were based upon correlational data obtained from an all-female population (9).

A later study also utilizing the Parental Authority Questionnaire developed by Dr. Buri (26) and an adaptation of Bell's Adjustment Inventory, investigated the impact of authoritarian parenting on adolescent home, health, and emotional adjustment, as compared authoritative parenting. Correlational survey results from 200 adolescents aged 16-19 confirmed the researcher's hypotheses that adolescents raised by authoritative parents have better home, health, and emotional adjustment (4). Comparing authoritarian to non-authoritarian parenting styles, higher levels of stress and tension have been shown in children of authoritarian parents, leading to increased likelihood for depression, irritability, fatigue, headaches, digestive problems, and use of addictive substances. Additionally, adolescents who view their relationship with parents as unsatisfying and stressful have been found to be less likely to eat, sleep or exercise appropriately. Alternatively, adolescents raised by authoritative parents have been found to be better at making decisions and planning positive life strategies. Therefore, the results indicate that the beneficial impact of authoritative parenting on adolescent emotional

adjustment may extend to include superior lifestyle habits including better dietary practices, as compared to adolescents raised by authoritarian parent (4).

Although there is a known relationship between childhood parental support and psychological well-being, self-worth, and personal control in young adulthood, the older adult population is often underrepresented in the research literature (7, 28). Therefore, Rothrauff et al. conducted a study that examined the impact of remembered parenting styles on later-life adjustment (7). Retrospective data on 2,231 adults aged 40 to 74 years was collected and analyzed in this study which investigated the relationship between remembered parenting styles and later-life psychological well-being, depressive symptoms, and substance abuse. The results showed that adults who remembered authoritarian or uninvolved parents reported significantly lower psychological well-being and significantly more depressive symptoms than those adults who remembered authoritative parents. Additionally, those adults who remembered having uninvolved parents reported significantly more substance abuse. Uninvolved parents were defined as those who displayed low responsiveness and demandingness and were characterized as emotionally detached and withdrawn. Further analysis of moderating factors indicated one significant gender interaction, one significant race interaction, and no significant interactions with childhood socioeconomic status (SES). With regards to psychological well-being, authoritative parenting provided significantly greater benefit to men than women. Additionally, among those adults who remembered authoritarian parents, Whites reported more depressive symptoms than non-Whites. Therefore, the results of this study indicate that outcomes associated with remembered parenting style can carry into adulthood, however moderating factors such as race and gender may have an influence (7).

Building on the body of literature examining the impact of parenting style on psychological adjustment in childhood and adolescence, McKinney et al. conducted a study investigating how parenting strategies are linked to emerging adulthood (10). This study focused on people aged 18 to 25 years because this is a period in life when most individuals are experiencing lots of changes, however the parental relationship may still play a significant role in the adjustment process (10, 17). Utilizing a wide variety of instruments, researchers gained insight into participants' perceived parenting style, parental attitudes, self-esteem, depression, and anxiety. Correlational data found that perceived authoritative parenting was inversely related and perceived authoritarian parenting was directly related to perceived harshness of discipline. Additionally, perceived authoritative parenting was inversely related and perceived authoritarian parenting was directly related to poor emotional adjustment in emerging adults. However, perceived harshness of discipline was not found to mediate the effects of perceived parenting on emotional adjustment. Further analysis of the results revealed several gender specific findings. First, perceived parenting style was found to be the strongest predictor of emotional adjustment for females; however, it was not found to be significantly related to emotional adjustment for males. For males, perceived discipline strategies were found to be more strongly related to their emotional adjustment. Therefore, the results of this study indicate that gender may be a significant factor mediating the relationship between perceived parenting style and emotional adjustment in emerging adulthood (10).

Adding to the literature, a longitudinal study of the effects of parenting style on psychological flexibility demonstrated the relationship between parenting style and self-regulation. Psychological flexibility is "a child's ability to respond to environmental demands

appropriately, with goal-directed action” (6). In this study, students who identified their parents as being authoritarian in Grade 7 reported lower psychological flexibility in Grades 9, 10, and 11. Alternatively, students who identified their parents as authoritative in Grade 12 had increased psychological flexibility in Grades 9-12 (6). Additional research studies have identified a positive correlation between parental psychological control and maladaptive self-regulation techniques in young adults aged 18-30, including undergraduate university students (6, 29, 30). Therefore, this study built on prior research and emphasized the significant relationship between perceived parenting style and the development of self-regulatory strategies that emerge in early adolescence and continue into young adulthood (6).

Interested in understanding the factors that may mediate the documented association between parenting style and child emotional outcomes, Niditch and Varela conducted a study investigating psychological correlates of this relationship, including anxiety and emotional self-efficacy (31). Youth anxiety may be a result of parental control and rejection. Controlling parenting tactics discourage independent thinking on the part of the child, therefore diminishing their perceived control over situational experiences. Perceived control is dependent on an individual’s perceived contingency of outcomes, or the extent to which they believe outcomes are contingent on their own actions versus factors outside of their control, and perceived competence, or their perceived ability to perform a certain action. The latter is the foundation of self-efficacy, defined by Albert Bandura. Additionally, parental rejection, such as criticism, blame, punishment, and withholding of warmth, may impair a child’s development of emotional regulation skills. Therefore, the researchers investigated the impact of parenting style, specifically controlling and rejecting parenting practices, on the development of anxiety

and emotional self-efficacy in adolescents aged 12-18 years. Data analysis revealed maternal rejection to be a significant predictor ($p < 0.001$) and maternal control to be a marginally significant predictor ($p = 0.056$) of anxiety; however, paternal rejection and control were not significantly related to anxiety. With respect to emotional self-efficacy, maternal rejection was the only factor that demonstrated a significant relationship ($p = 0.002$). Maternal control, paternal control, and paternal rejection did not predict emotional self-efficacy. However, emotional self-efficacy significantly predicted anxiety, such that adolescents with lower emotional self-efficacy had higher levels of anxiety. Therefore, the results of this study demonstrate that emotional self-efficacy mediates the relationship between maternal rejection and adolescent anxiety. The authors hypothesized that a potential explanation for this relationship is that parental rejection may teach adolescents that positive emotional outcomes, such as parental warmth and approval, are rare and not under their control, resulting in increased adolescent anxiety related to behaving appropriately (31).

Parenting Style and Child Feeding

Parenting style not only influences children emotionally, but also behaviorally. One area of behavioral regulation where parenting style impacts the parent-child interaction is feeding. Dr. Baumrind's taxonomy of parenting styles has been expanded upon to include characteristic feeding styles, certain of which may be obesogenic and establish undesirable nutrition habits (12). Permissive parent feeding styles have been related to low modeling during feeding, little food preparation at home, high permissiveness with regard to the type and

amount of food consumed, little to no meal structure, high energy intake, and child-led snacking (8, 11, 12). Authoritative feeding has been found to be linked to permissive feeding with respect to the recognition of the child's responsibility for eating and high permissiveness related to intake, however it adds a key element of child involvement pertaining to food preparation (8). Therefore, while authoritative parents may monitor the types of foods offered to promote child health, they view feeding as the child's responsibility and present the child with options; resulting in shared control over determining which foods they will consume (8, 11, 12). Conversely, authoritarian parenting has been related to controlled, restrictive feeding that includes rigidly monitoring intake (8). Children of authoritarian parents are often forced to eat certain foods and completely avoid others, with no regard for their personal preferences (11). This may result in learned ignorance of satiety cues and excessive consumption of restricted foods when available (12). Parental feeding styles have been shown to shape child food preferences and eating patterns, and restriction of intake during feeding has been related to increased intake and body weight, as well as poor emotional regulation (11, 8). Additionally, permissive feeding has been shown to be correlated with poor diet quality (14). However, authoritative parenting is correlated with lower body mass index (BMI) and more healthful dietary intake (13).

Since most research on the topic of parental feeding styles is conducted on non-Hispanic White individuals, Patrick et al. conducted a study aimed at identifying the associations between parental feeding styles and child food consumption patterns among African American and Hispanic caregivers (11). Although both authoritative and authoritarian feeding styles aim to gain child compliance with parental requests, different tactics are utilized.

Authoritative parents utilize reasoning and explanation of healthful eating, whereas authoritarian parents may resort to threats or bribes to influence child intake. Therefore, Patrick et al. utilized the Caregiver's Feeding Style Questionnaire (CFSQ) and assessed the availability, feeding attempts, and consumption of dairy, fruit, and vegetables to determine the association between feeding styles and food consumption patterns among 231 primary caregivers of preschool aged children. With regards to availability, authoritative caregivers were more likely to make fruit ($p < .0001$) and vegetables ($p < .01$) available, whereas authoritarian caregivers were less likely to make fruits ($p < .05$) and vegetables ($p < .01$) available. There were no significant differences in the availability of dairy between authoritative and authoritarian parents. Additionally, authoritative caregivers were more likely to attempt to get their children to consume dairy ($p < .01$), fruit ($p < .0001$), and vegetables ($p < .0001$). However, there were no significant associations between feeding attempts and authoritarian caregivers. Lastly, results of the study indicate that children of authoritative caregivers were more likely to eat dairy ($p < .001$) and vegetables ($p < .05$), and children of authoritarian caregivers were less likely to eat vegetables ($p < .05$). Although this study is limited by its correlational design, it expands on the current literature by reaching an understudied population and assessing how the different approaches to achieving child feeding compliance result in different intake outcomes. While authoritarian parents may have noble intentions for promoting healthful eating patterns, the tactics employed by authoritative parents are shown to be more effective at promoting healthful eating patterns in children (11).

In order to gain further understanding of the relationships between parenting style, feeding practices, and child BMI, Blissett and Haycraft collected self-report questionnaire data

from 48 families with pre-school aged children (23). This study built on previous research by including paternal responses in order to gain insight into father-child feeding interactions, which are frequently overlooked in research studies. Assessing parents' feeding practices, permissive parenting was found to be negatively associated with monitoring children's unhealthy food intake, greater maternal use of restrictive feeding, and greater paternal pressure to eat. Permissive feeding practices may inhibit children's ability to self-regulate their intake. Although permissive parents, specifically fathers, may pressure their children to consume healthful foods, they often fail to model desired behaviors. Additionally, these parents often fear confrontation. Therefore, they frequently offer rewards to gain compliance, consequently teaching emotional and disinhibited eating. Opposite of permissive parenting, authoritative parenting was negatively correlated with paternal pressure to eat. This relationship is likely moderated by setting appropriate boundaries and shared control between the parents and children. This practice facilitates autonomy and encourages child self-regulation of eating behaviors. Contrary to the researchers' hypothesis, authoritarian parenting was not found to be related to any feeding practices, including all domains of controlling feeding. Additionally, there was no association found between parenting style and child BMI (23). This finding is similar to those of other studies examining the relationship between parenting style and weight of preschool aged children (32); however, longitudinal studies demonstrate that parenting style may have a long-term effect on weight status in later childhood and adolescence (3, 23).

In order to determine if parenting style can be predicted from feeding practices, Hubbs-Tait conducted a randomized controlled trial examining the relationship between six feeding styles and authoritarian, authoritative, and permissive parenting (8). Utilizing a sample of 239

parents of first-grade children, parents completed ten questionnaires, including the Child Feeding Questionnaire (CFQ) and the Parenting Styles and Dimensions Questionnaire (PSDQ). Six feeding styles were examined with respect to parenting style including responsibility, monitoring, modeling, encouraging, restriction, and pressure to eat. Of these six feeding styles, responsibility, monitoring, and modeling positively predicted and restricting negatively predicted authoritative parenting. Authoritarian parenting was positively predicted by restricting and pressuring, and negatively predicted by monitoring. Modeling was negatively correlated with permissive parenting, whereas restricting was positively correlated. All of these relationships were statistically significant. Therefore, the results indicate that there is a relationship between feeding practices and each parenting style; however, it is most significant for authoritative parenting. Despite the limited generalizability of the findings, the results of this study indicate that feeding practices are predictive of parenting styles (8).

By examining associations between parenting styles, family structure, and adolescent dietary intake, it was the goal of Pearson et al. to add to the literature on food-related parenting practices (33). Cross-sectional data was collected from adolescents aged 12-16 years including information on who they lived with at home, such as whether they had a single- or dual-parent household and their number of siblings. With respect to overall consumption, males were found to consume more snacks per day and eat breakfast more days a week than females. For other dietary behaviors, adolescents with authoritative parents were found to consume more fruit, eat fewer unhealthy snacks, and eat breakfast more days a week than adolescents with neglectful parents. The differences in consumption were significant across parental status, sibling status, brother status, and sister status. Across sibling status, brother status, and sister status,

adolescents with authoritarian parents were also found to consume fewer unhealthy snacks than adolescents with neglectful parents, and adolescents with authoritative parents were found to eat breakfast more days per week than adolescents with indulgent parents. Therefore, overall, adolescents with authoritative parents had more favorable dietary quality as compared to all other parenting styles. It is important to note that more older adolescents considered their parents to be neglectful than younger adolescents, and more younger adolescents described their parents as authoritative than older adolescents. Therefore, this indicates that parenting style may not be consistent, or perceived as consistent, throughout the transition from childhood to adulthood (33).

Continuing the research on the impact of family on child dietary habits, Berge and colleagues investigated the association between parenting style and frequency of family meals (13). This association was of importance to the researchers because the literature has indicated that family meals may promote healthful dietary intake and reduce the risk for obesity. Therefore, longitudinal data was collected from 806 participants from the Project Eating Among Teens (EAT) study in which data was available from two time points, five years apart. Family meal frequency was assessed and compared to adolescents' self-reports of parenting style. In order to determine parenting style, parental responsiveness and demandingness were measured. Based on this measure, parents were characterized as authoritative, authoritarian, permissive, or neglectful. Permissive and neglectful parents were differentiated in that while neither enforced discipline or set expectations, permissive parents were characterized as empathic but neglectful parents were emotionally uninvolved. For both boys and girls, maternal authoritative parenting style was most common. However, the most common paternal parenting

style differed between boys and girls. Paternal authoritarian style was most common among girls and paternal authoritative parenting was most common among boys. At time one, maternal authoritative parenting was associated with the most frequent family meals and maternal neglectful parenting was associated with the least frequent family meals for both boys and girls ($p < 0.01$). Paternal authoritative parenting was associated with the most frequent family meals and paternal neglectful parenting was associated with the least frequent family meals for girls ($p < 0.01$). However, there was no significant relationship between paternal authoritative parenting style and frequency of family meals for boys. Upon completion of the five year follow up, parenting style only significantly predicted the frequency of family meals for opposite sex parent/adolescent pairs ($p < 0.01$) (13). Previous research has found paternal encouragement of dieting to be positively associated with restrictive weight control behaviors among daughters (34, 35). Therefore, the results of this study builds on the literature indicating that the opposite-sex parent may significantly influence adolescent health behaviors, specifically dietary intake (13).

Research has demonstrated that parents have the opportunity to directly influence the development of their child's nutrition behaviors, habits, and attitudes through their parental feeding style. Interested in the relationship between parental feeding style and diet quality, Hennessy et al. conducted a cross-sectional study investigating the association between parental feeding style and child dietary intake for 99 parent-child dyads of elementary school aged children. Utilizing the Caregiver's Feeding Styles Questionnaire, measuring parents demandingness and responsiveness, and the Child Feeding Questionnaire, focusing on parental practices of restriction, monitoring, and pressure to eat, primary attention was directed towards

child consumption of low nutrient dense foods (14). Low nutrient dense foods were defined as “energy-dense foods that provide modest nutritional value,” and those which may result in the development of overweight and obesity. The data revealed several significant findings. First, permissive feeding style was positively related to energy intake ($p<0.01$), intake of low nutrient dense foods ($p<.001$), sweetened beverages ($p=0.03$), fats and oils ($p=0.01$), meat and beans ($p=0.01$), and milk intake ($p=0.01$). In opposition, authoritative feeding was negatively associated with intake of low nutrient dense foods ($p=0.04$), and fats and oils ($p=0.02$). Additionally, restrictive feeding style and monitoring of child intake was related to increased child consumption of low nutrient dense foods when in the presence of permissive parents ($p<0.05$), but not while in the presence of non-permissive parents ($p<0.05$). Therefore, the results indicate that parenting style may have a significant impact on the effectiveness of parenting practices in regards to consumption of low nutrient dense foods. While restricting or monitoring a child’s intake may be a successful practice for parents who do not demonstrate a permissive feeding style, for those who do these practices may backfire. Therefore, the child may develop an increased desire for the restricted or monitored foods. Although causation cannot be inferred from this study, the results present a potential pathway mediating the relationship between permissive parental feeding style and elevated child weight (14).

Another opportunity parents have to impact their child’s dietary intake in an advantageous way is by having family meals. Family meals present parents with the chance to practice role modeling of healthful dietary habits, and research evidence indicates there is a positive association between family meals and diet quality among adolescents (16, 36). Evaluating the relationship between family meal frequency and dietary intake among 90

households, Welsh et al. found family meal frequency to be positively associated with adult fruit and vegetable intake and negatively associated with sweets and sugar-sweetened beverage intake among children (36). Additionally, a longitudinal study evaluating the relationship between diet quality and family meal frequency among adolescents found a positive association between family meal frequency and adolescent intake of vegetables, calcium-rich foods, fiber, and several nutrients including calcium, iron, magnesium, potassium, zinc, vitamin B₆, and folate. This association was consistent across genders, therefore indicating that family meals play an important role in enhancing adolescents' diet quality (37). With respect to weight status, a 2013 study found a lower prevalence of overweight and obesity among adolescents who reported eating breakfast as a family (38). Additionally, a study evaluating the relationship between family meals and diet quality and weight status among 145 students attending alternative high schools found that those students who reported no family meals in the past week were three times more likely to be overweight than students who reported eating five to seven family meals per week (39). Therefore, there is evidence which indicates family meals may play a protective role in preventing childhood and adolescence overweight or obesity and result in improved dietary intake.

Since research suggests family meals play an important role in the establishment of healthful dietary habits, Berge et al. conducted a study in 2010 investigating the relationship between parenting style and family meal frequency in an attempt to understand how the home environment is related to family meals (13). Analysis of data collected at Time 1, when participants were in middle school, determined that both maternal and paternal authoritative parenting styles were associated with the highest occurrence of family meals for daughters,

whereas for sons only maternal authoritative parenting style was found to be associated with increased family meal frequency. However, longitudinal data collected from this study indicated that parenting style only predicted family meal frequency five years later for opposite sex parent-child dyads, therefore indicating that the opposite sex parent may have a unique influence on adolescent health behaviors. While authoritative parenting is associated with family meal frequency, the mechanism through which this relationship is formed has not yet been determined (13).

Parenting Style and Child Weight

The increased prevalence of childhood overweight and obesity in recent decades is a national concern (3, 16, 23). Therefore, it is essential to gain insight into potential factors associated with the rising trend, one of which is parenting style. A longitudinal research study conducted by Rhee et al. examined the relationship between parenting style and overweight status in first grade children (3). In order to determine maternal parenting style, researchers coded videotapes of standardized interaction tasks between mother and child at age 54 months. Based on the mother's sensitivity to her child's needs and expectations for child self-control, she was categorized as demonstrating one of four parenting styles – authoritarian (low sensitivity, high expectations), authoritative (high sensitivity, high expectations), permissive (high sensitivity, low expectations), or neglectful (low sensitivity, low expectations). Two years later, upon reaching the child's first grade school year, heights and weights were collected for

872 children comprising the study sample. Data analysis revealed that 3.9% of children with authoritative mothers, 17.1% of children with authoritarian mothers, 9.8% of children with permissive mothers, and 9.9% of children with neglectful mothers were overweight. Therefore, children of authoritarian mothers were five times more likely ($p < 0.001$) and children of permissive or neglectful mothers were two times more likely ($p = 0.03$) than children of authoritative mothers to be overweight. These findings remained statistically significant once controlling for the child's weight status at 36 months, indicating that parenting style was not affected by the child's prior weight status (3). Therefore, this study provides evidence for the protective effect of authoritative parenting on childhood weight. By providing an environment sensitive to a child's emotional needs and development and establishing reasonable expectations, authoritative parents allow their children to develop effective self-regulation of eating behaviors resulting in improved weight control (3).

Following upon the aforementioned study, Rhee summarized the available research in a literature review on the relationship between parenting style and childhood overweight (16). Acknowledging that parents are responsible for creating an environment that supports certain behaviors and establishes certain beliefs, the author examined the relationship between parental feeding practices (i.e. prompting intake, restricting food access), parental behaviors (i.e. modeling), and parental influences (i.e. parenting style, family function). Examining studies related to parental feeding practices, Rhee concluded that parental prompting to eat may undermine child autonomy and result in increased energy consumption, the use of rewards for food consumption may effect child development of food preferences, and restricting food access may increase the appeal of restricted foods making them over consumed when available.

Additionally, Rhee identified that studies exploring parental behaviors show that exposure and availability of healthy foods may impact child food preferences, allowing children to choose their portion size may improve self-regulatory skills, and parental modeling of healthy behaviors may shape child behaviors. Lastly, summarizing the literature on parental influences, parenting style may impact child consumption and weight status by influencing the aforementioned parental feeding practices and parental behaviors. Therefore, with respect to child weight, the reviewed literature demonstrated that these parent-level factors likely work interdependently to contribute to child consumption and weight status. Therefore, parents play an important role in helping regulate child weight both behaviorally and cognitively. Not only do parents help mold specific child behaviors, but they also influence their child's attitudes and beliefs related to specific foods and eating habits (16).

Building on the previous study conducted by Berge et al. utilizing the Project EAT study, Berge, Wall, Loth, and Neumark-Sztainer examined longitudinal data in order to examine the relationship between parenting style and adolescent weight status (40). Although studies have identified an association between parenting style and weight status in children, this study was interested in the longer-term impact of parenting style on weight status. Examining change in weight status over a five year time period, data was collected for 2516 adolescents. The mean age of the study sample at time one was 12.8 years, and at time two the mean age was 17.2 years. Data collected included the participants' perceived parenting style, BMI score, dietary intake, and physical activity level. Comparing participants' BMI scores at time one and time two, maternal authoritative parenting style was shown to play a protective role related to BMI in both sons and daughters. Conversely, maternal authoritarian parenting style at time one

predicted significantly higher BMI scores for sons at time two ($p < 0.01$), and maternal neglectful parenting predicted significantly higher BMI scores for daughters at time two ($p < 0.01$). There were no other significant findings related to BMI scores for mothers or fathers. However, an additional significant finding related to fruit and vegetable intake demonstrated that daughters of permissive fathers consumed more fruits and vegetables at time two as compared to daughters of authoritarian fathers ($p < 0.01$). There was no difference in fruit and vegetable consumption found between daughters of permissive and authoritative fathers ($p = 0.14$). Therefore, it is possible that paternal warmth and caring, characteristic of responsiveness, plays a more significant role than structure, characteristic of demandingness, in determining their daughter's dietary intake. This study adds to the literature indicating that fathers may play a significant role in determining their daughter's dietary intake, and also indicates that parenting style may have a long-term impact on weight status past childhood and into late adolescence (40).

Interested in identifying the role of parenting style and child feeding practices in the etiology of childhood obesity, Stang and colleagues summarized the literature regarding various factors that may mediate the relationship (15). With regards to parenting style and weight status, authoritative parenting has been associated with lower risk for obesity, and authoritarian and indulgent parenting has been associated with increased risk for obesity. These relationships have been supported in the literature throughout both childhood and adolescence. Assessing child feeding practices, the review of the literature found similar findings as those described in the 2008 review conducted by Rhee (16). Parental feeding practices such as pressure to eat, monitoring intake, food restriction, parental modeling of healthy eating, and

food availability and accessibility may all have an impact on a child's overall dietary quality and food consumption. However, other factors such as genetic predisposition for obesity, appetitive traits, and other environmental influences likely also influence a child's weight status (15). Although the literature has shown associations between parenting style and weight status throughout childhood and adolescence, less research examines weight status related to parenting style in the adult population.

One study that investigated the long-term relationship between the weight status and health behaviors was conducted by Niemeier and Hektner comparing college aged students to their parents (41). Utilizing the Parental Authority Questionnaire (PAQ), the Block Brief Food Frequency Questionnaire, and the Global Physical Activity Questionnaire, parent-child comparisons were made for body mass index (BMI), energy intake, and energy expenditure. Overall, young adults were found to have lower BMIs, consume more energy, and expend more energy than adults. Between young adults and their parents, BMI scores were found to be moderately correlated, energy intake had a moderate to strong correlation, and energy expenditure was not correlated. With respect to parenting style, authoritarian and permissive parenting style predicted the relationship between young adult and parent BMI scores. High levels of authoritarian parenting resulted in no relationship, low levels of authoritarian parenting resulted in a positive relationship, and high levels of permissive parenting resulted in a negative relationship between parent and young adult BMI scores. Additionally, for energy consumption, authoritative parenting was found to be directly positively related to calories consumed by young adults. However, high levels of authoritarian parenting resulted in an inverse relationship and low levels of authoritarian parenting resulted in a positive relationship

between calorie consumption of young adults and their parents. These results indicate that young adults who perceive their parents as authoritarian may rebel and act in a manner opposite of their parents. While previous studies have reported findings demonstrating that authoritative parenting is associated with increased positive health behaviors during the transition from childhood to adolescence, this study indicates that authoritative parenting may also play a protective role when transitioning into adulthood. Therefore, the findings of this study indicate that there is a long-lasting relationship between parents' and young adults' weight status and weight related health behaviors (41).

Self-Efficacy

Self-efficacy is a psychological correlate often studied with respect to behavior change. Defined by Albert Bandura, efficacy expectation, or self-efficacy, is the confidence an individual has in their ability to execute a behavior that will lead to a desired outcome (42). Self-efficacy is often developed through a combination of personal accomplishments, secondhand experience, verbal coaxing, and emotional stimulation. Combined with an appropriate skill set and an incentive, self-efficacy can produce a desired behavior. Self-efficacy affects behavior in a myriad of ways. Most simply, it influences an individual's choice of activities because people tend to choose activities they view themselves as capable of handling. However, self-efficacy also influences the amount of effort an individual will put into an activity and how long they will continue to practice a behavior when faced with challenges or obstacles. Therefore, magnitude and strength of self-efficacy will impact an individual's

ability to complete a task at various difficulty levels based on their perceived level of mastery (42). One behavior that has been extensively studied with respect to an individual's self-efficacy is their fruit and vegetable consumption.

Fruit and Vegetable Consumption

College students, when transitioning from living at home to living independently, develop nutrition habits that can shape their future health (1, 2). Despite the significance of this impressionable time period, the low prevalence of chronic diseases among college students has resulted in inadequate attention given to this population's dietary habits (2). Fruit and vegetable consumption has been linked to lower risk of chronic diseases such as cardiovascular disease and cancer. Therefore, adopting good nutritional practices, including appropriate consumption of fruits and vegetables, during college-aged years may translate to better later life health status. However, in 2006, a study conducted by the American College Health Association reported that only 7% of studied students consumed five or more fruits and vegetables a day (20). Knowledge alone does not equate to behavior change; however, self-efficacy is a highly studied psychological correlate that has been shown to help bridge the knowledge-behavior gap with respect to health behavior change, specifically fruit and vegetable consumption (2).

Acknowledging the relationship between self-efficacy and fruit and vegetable consumption, Richards, Kattelman, and Ren conducted a study interested in identifying ways to motivate college aged students to increase their fruit and vegetable consumption (1). Utilizing 314 students aged 18-24 years, investigators assessed participant's fruit and vegetable

consumption, decisional balance, and self-efficacy. Over four months, students randomized to the intervention group were contacted by researchers via personalized letters, newsletters, in-person motivational interviewing sessions, and e-mail correspondence. Students randomized to the control group did not receive any contact from research personnel over the four month study. Comparing measures from baseline to follow-up, students in the intervention group had a significantly greater increase in their fruit and vegetable consumption compared to students in the control group ($p < 0.001$). Additionally, although self-efficacy scores did not differ between groups at baseline, at follow-up the intervention group had significantly higher self-efficacy scores than the control group ($p < 0.05$). Therefore, the increase in fruit and vegetable consumption from baseline to follow-up may have been mediated by increased self-efficacy related to the intervention (1).

Building on the findings from Richards' research, Luszczynska et al. conducted a study comparing a self-efficacy intervention to a combined self-efficacy and action plan intervention (19). Citing the large body of evidence supporting a relationship between self-efficacy and increased fruit and vegetable consumption, the researchers suggested that a self-efficacy intervention combined with action planning would enhance the intervention's overall impact. Therefore, researchers conducted a randomized controlled trial collecting longitudinal data from 285 adults aged 18-60 years over a six month study period. Participants were randomized to one of three groups: control, self-efficacy intervention, or combined self-efficacy and action plan intervention. Results indicated that participants in both intervention groups reported significantly increased fruit and vegetable consumption six months after the intervention when compared to the control group ($p < 0.01$). Additionally, participants in both intervention groups

had significantly greater change in self-efficacy when compared to the control group, which was shown to mediate their change in fruit and vegetable consumption. For the combined self-efficacy and action plan intervention group, both self-efficacy and planning were found to mediate the change in consumption, but there was no significant difference in the increased fruit and vegetable consumption between intervention groups. Therefore, action planning did not enhance the impact of a self-efficacy intervention. However, self-efficacy was once again shown to be a strong predictor of increased fruit and vegetable consumption (19).

In today's society, college students are often subject to poor dietary habits and low physical activity levels. One potential reason for reduced movement is the prominence of computer technology. Many college students today have grown up with computers and are accustomed to gathering information via online sources. Therefore, Franko et al. developed an innovative study attempting to utilize the internet to disseminate nutrition and physical activity information to college students (20). Four hundred seventy-six collegiate students participated in the study providing researchers with data regarding their typical food consumption, stage of dietary and physical activity change, nutrition knowledge, physical activity frequency, social support, self-efficacy for dietary changes, and perceived exercise benefits and barriers. Data revealed that the participants in the experimental groups, who received access to two web sessions of an interactive internet-based nutrition and physical activity education program, increased their fruit and vegetable intake from baseline to post-test when compared to the control group ($p < 0.01$). However, there were no longer any differences in fruit and vegetable consumption between groups by the three and six month follow-ups. Additionally, the experimental I group, who received the two web sessions but no booster session, had

significantly greater self-efficacy to eat fruit and vegetables compared to the control group at post-test. Interestingly, there were no differences in physical activity level between participants in any group at any time point. Therefore, the results of this study add to the literature demonstrating that knowledge does not equal behavior. Although increases in self-efficacy and fruit and vegetable consumption were found from baseline to post-test in the experimental groups, this did not correlate to long-term maintenance of behavioral change. However, changes in attitudinal measures were more consistent over time with participants in the experimental groups reporting significantly higher perceived benefits and significantly lower perceived barriers to exercise than participants in the control group. Therefore, the decline in behavioral change after program cessation indicates that college students may need frequent support over time in order to maintain healthful behaviors (20).

The parent-child feeding dynamic may have a significant impact on a child's cognitions and intentions related to fruit and vegetable consumption. Opposite of controlling parental feeding practices that often fail to result in desired child eating behaviors, parental modelling of positive health behaviors, such as fruit and vegetable consumption, may result in increased child perceived behavioral control, or self-efficacy, for similar behaviors. Therefore, a study conducted in Norwegian primary schools assessed the cognitions and behaviors of fifth and sixth grade students related to fruit and vegetable consumption (21). Survey measures were utilized to assess the relationship between child intentions and behaviors related to fruit and vegetable consumption with respect to their self-efficacy, attitudes, and social influence. Data analysis revealed that child self-efficacy was the single most important variable mediating the relationship between child intentions and behaviors related to fruit and vegetable consumption.

Additionally, parental social influence, specifically parental modelling and encouragement, was also positively related to daily fruit and vegetable consumption. Parent feeding practices were considered the social influence because parents have been shown to be the most important social agent impacting diet in children. Conversely, child attitudes related to fruit and vegetable consumption were shown to only be related to child intentions to eat fruits and vegetables, but not correlated to consumption. Therefore, the results demonstrate that child cognitions, specifically self-efficacy, and parental feeding practices are related to child fruit and vegetable consumption, with self-efficacy seemingly being the most influential variable (21).

A potential explanation for the relationship between self-efficacy and fruit and vegetable consumption is that self-efficacy acts as a bridge spanning the intention-behavior gap. Although planning is an additional potential connector, without self-confidence it is unlikely that an individual will be able to carry out even the most detailed plans. Consequently, as shown in the aforementioned Luszczynak study, without self-efficacy, planning strategies are likely not sufficient to produce a desired behavior (19). Therefore, Kreausukon et al. conducted a randomized controlled study to examine how a self-efficacy and planning intervention would compare to a health education session in terms of impacting the self-efficacy of undergraduate university students (2). The control group, simply receiving health education, was given general nutrition handouts and asked to read them on their own. Alternatively, the intervention group received a psychological program that addressed self-efficacy enhancement as well as action and coping planning. Although there were no significant differences between groups at baseline, the participants in the intervention group consumed significantly greater fruits and vegetables at the posttest ($p < 0.01$) and follow-up

($p=0.01$). Additionally, data revealed a significant difference in self-efficacy from baseline to posttest ($p<0.01$) and follow-up ($p<0.001$) for the participants in the intervention group versus the control group. However, both groups demonstrated an increase in self-efficacy from baseline to posttest. Intention to eat fruits and vegetables also increased for both the control and intervention groups from baseline to posttest; however, where the intervention group had increased intention to eat from posttest to follow-up, intention dropped for participants in the control group. Lastly, planning for fruit and vegetable consumption was shown to increase from baseline to posttest and follow-up only for those participants in the intervention group. Results from this study were unable to identify whether a single factor was the most significant predictor of fruit and vegetable consumption or if it was a cumulative effect of all intervention components. However, studying the collegiate population which often faces challenges with inconsistent schedules, odd hours, and a challenging environment, it is proposed that in addition to self-efficacy, coping planning was predictive of fruit and vegetable consumption (2).

Not only is fruit and vegetable consumption related to disease risk, it is also known to be a significant predictor of overall diet, total caloric intake, and weight status. Therefore, change in fruit and vegetable consumption is often a factor for weight loss studies. However, behavioral weight loss treatments often result in significant initial weight loss followed by weight regain upon program completion. This indicates there is a missing link. Annesi attempted to identify the missing component in a 2011 study designed to assess the psychological correlates of successful weight loss (22). Utilizing a study sample of 183 obese adults, data was collected regarding fruit and vegetable consumption, exercise volume, self-

efficacy for appropriate eating, and self-efficacy for maintaining exercise. Participants received exercise and nutrition support including one-on-one meetings with an exercise specialist, personalized exercise plans, group nutrition sessions with a wellness specialist, and instruction for self-regulation of appropriate eating. Goal-setting and self-regulatory skills were emphasized throughout the program in an attempt to build participant perceived competence, or self-efficacy, to eat and exercise appropriately. Data analysis spanning the 26 week study period revealed that participants' change in weight was significantly predicted by change in fruit and vegetable consumption and change in exercise ($p < 0.001$). Change in fruit and vegetable consumption was significantly predicted by change in self-efficacy for appropriate eating ($p < 0.001$) and change in self-regulatory skills for appropriate eating ($p = 0.04$). Change in exercise was significantly predicted by change in self-efficacy for maintaining exercise ($p < 0.001$) and change in self-regulatory skills for maintaining exercise ($p < 0.001$). These results demonstrate that change in self-efficacy most directly impacts change in behavior, diet or exercise. However, development of regulatory skills strengthens this relationship and may play a role in both weight loss and maintenance (22).

According to the Environmental Research framework for weight gain Prevention (EnRG), parenting practices may impact adolescent eating behaviors directly or indirectly through cognitions including dietary self-efficacy (43). The latter, indirect influence of self-efficacy on dietary behaviors was at the center of a research study conducted by Pearson, Ball and Crawford (43). However, unlike most studies which utilized child report of perceived parenting style, this study examined parent reports of their behaviors and cognitions related to feeding. Sixteen hundred and six parent-adolescent dyads participated in this study, and data

analysis revealed several significant findings. Parents of boys reported higher parental control than those of girls, and parents of adolescents in Grade 7 reported higher parental control than those of children in Grade 9. Additionally, girls reported significantly higher levels of self-efficacy for increasing their fruit consumption despite already consuming significantly more fruit than boys. Self-efficacy for increasing fruit consumption was also found to be positively associated with parental control and parental recognition of the importance of healthy nutrition for adolescents. Furthermore, self-efficacy was found to mediate both of these associations. Conversely, parental barriers to purchasing produce were inversely associated with adolescent self-efficacy. Lastly, self-efficacy was also found to be positively associated with adolescent fruit consumption. Therefore, the results of this study demonstrate that self-efficacy is important when targeting healthy eating behaviors, and parenting practices play a role in nurturing or diminishing this cognition within their children (43).

REFERENCES

1. Richards A, Kattelman KK, Ren C. Motivating 18- to 14-year olds to increase their fruit and vegetable consumption. *J Am Diet Assoc.* 2006;206z; 1405-1411.
2. Kreausukon P, Gellert P, Lippke S, Schwarzer R. Planning and self-efficacy can increase fruit and vegetable consumption: A randomized controlled trial. *J Behav Med.* 2012;35:443-451.
3. Rhee KE, Lumeng JC, Appugliese DF, Kaciroti N, Bradley RH. Parenting styles and overweight status in first grade. *Pediatrics.* 2006;117: 2047-2054.
4. Sartaj B, Aslam N. Role of authoritative and authoritarian parenting in home, health and emotional adjustment. *J Behav Sci.* 2010;20:47-66.
5. Baumrind D. Effects of authoritative parental control on child behavior. *Child Dev.* 1966;37: 887-907.
6. Williams KE, Ciarrochi J, Heaven PCL. Inflexible parents, inflexible kids: A 6-year longitudinal study of parenting style and the development of psychological flexibility in adolescents. *J Youth Adolescence.* 2012;41:1053-1066.
7. Rothrauff TC, Cooney TM, Shin An J. Remembered parenting styles and adjustment in middle and late adulthood. *J Gerontol B Psychol Sci Soc Sci.* 2009;64B(1):137-146.
8. Hubbs-Tait L, Kennedy TS, Page MC, Topham GL, Harrist AW. Parental feeding practices predict authoritative, authoritarian, and permissive parenting styles. *J Am Diet Assoc.* 2008;108:1154-1161.
9. Ferrari JR, Olivette MJ. Perceptions of parental control and the development of indecision among late adolescent females. *Adolescence.* 1993;28(112):963-970.
10. McKinney C, Milone MC, Renk K. Parenting and late adolescent emotional adjustment: Mediating effects of discipline and gender. *Child Psychiatry Hum Dev.* 2011;42:463-481.
11. Patrick H, Nicklas TA, Hughes SO, Morales M. The benefits of authoritative feeding style: Caregiver feeding styles and children's food consumption patterns. *Appetite.* 2005;44:243-249.

12. Saxton J, Carnell S, Van Jaarsveld CHM., Wardle J. Maternal education is associated with feeding style. *J Am Diet Assoc.* 2009;109: 894-898.
13. Berge JM, Wall M, Neumark-Sztainer D, Larson N, Story M. Parenting style and family meals: Cross-sectional and 5-year longitudinal associations. *J Am Diet Assoc.* 2010;110:1036-1042.
14. Hennessy E, Hughes SO, Goldberg JP, Hyatt RR, Economos CD. Permissive parental feeding behavior is associated with an increase in intake of low-nutrient-dense foods among American children living in rural communities. *J Am Diet Assoc.* 2012;112: 142-148.
15. Stang J, Loth, KA. Parenting style and child feeding practices: Potential mitigating factors in the etiology of childhood obesity. *J Am Diet Assoc.* 2011;111(9): 1301-1305.
16. Rhee K. Childhood overweight and the relationship between parent behaviors, parenting style, and family functioning. *Ann Am Acad Polit Soc Sci.* 2008;615: 12-37.
17. Agliata AK, Renk K. College students' adjustment: The role of parent-college student expectation discrepancies and communication reciprocity. *J Youth Adolescence.* 2008;37:967-982.
18. Bandura A. Self-efficacy: Toward a unifying theory of behavioral change. *Psychol Rev.* 1977;84(2): 191-215.
19. Luszczynska A, Tryburcy M, Schwarzer R. Improving fruit and vegetable consumption: A self-efficacy intervention compared with a combined self-efficacy and planning intervention. *Health Edu Res.* 2007;22(5): 630-638.
20. Franko DL, Cousineau TM, Trant M, Green TC, Rancourt D, Thompson D, Ainscough J, Mintz LB, Ciccazzo M. Motivation, self-efficacy, physical activity and nutrition in college students: Randomized controlled trial of an internet-based education program. *Prev Med.* 2008;47: 369-377.
21. Melbye EL, Overby NC, Ogaard T. Child consumption of fruit and vegetables: The role of child cognitions and parental feeding practices. *Public Health Nutr.* 2011;15(6): 1047-1055.
22. Annesi JJ. Self-regulatory skills usage strengthens the relations of self-efficacy for improved eating, exercise, and weight in the severely obese: Toward an explanatory model. *Behav Med.* 2011;37: 71-76.
23. Blissett J, Haycraft E. Are parenting style and controlling feeding practices related? *Appetite.* 2008;50:477-485.

24. Baumrind D. Reciprocal rights and responsibilities in parent-child relations. *J Soc Issues*. 1978;34(2): 179-196.
25. Mann L, Burnett P, Radford M, Ford S. The Melbourne decision making questionnaire: An instrument for coping with decisional conflict. *J Behave Decis Making*. 1997;10:1-19.
26. Buri JR. Parental authority questionnaire. *J Pers Assess*. 1991;57(1):110-119.
27. Buri JR. Self-esteem and appraisals of parental behavior. *J Adolescent Res*. 1989;4(1):33-49.
28. Wickrama KAS, Lorenz FO, Conger RD. Parental support and adolescent physical health status: A latent growth-curve analysis. *J Health Soc Behav*. 1997;38:149-163.
29. Manzeske DP, Stright AD. Parenting styles and emotion regulation The role of behavioral and psychological control during young adulthood. *J Adult Dev*. 2009;16:223-229.
30. Krause ED, Mendelson T, Lynch TR. Childhood emotional invalidation and adult psychological distress: The mediating role of emotional inhibition. *Child Abuse Neglect*. 2003;27: 199-213.
31. Niditch LA, Varela RE. Perceptions of parenting, emotional self-efficacy, and anxiety in youth: Test of a mediational model. *Child Youth Care For*. 2012;21: 21-35.
32. Whitaker R, Wright J, Pepe M, Seidel K, Dietz W. Predicting obesity in young adulthood from childhood and parental obesity. *N Engl J Med*. 1997;337: 869-873.
33. Pearson N, Atkin AJ, Biddle SJH, Gorely T, Edwardson C. Parenting styles, family structure and adolescent dietary behavior. *Public Health Nutr*. 2009;13(8): 1245-1253.
34. Thelen MH, Cormier JF. Desire to be thinner and weight control among children and their parents. *Behav Ther*. 1995;26:85-89.
35. Dixon RS, Gill JMW, Adair VA. Exploring paternal influences on the dieting behaviors of adolescent girls. *Eating Disorders*. 2003;11:39-50.
36. Welsh EM, French SA, Wall M. Examining the relationship between family meal frequency and individual dietary intake: Does family cohesion play a role? *J Nutr Educ Behav*. 2011;43: 229-235.
37. Burgess-Champoux TL, Larson N, Neumark-Sztainer D, Hannan PJ, Story M. Are family meal patterns associated with overall diet quality during the transition from early to middle adolescence. *J Nutr Educ Behav*. 2009;41(2): 79-86.

38. Larson N, MacLehose R, Fulkerson JA, Berge JM, Story M, Neumark-Sztainer D. Eating breakfast and dinner together as a family: Associations with sociodemographic characteristics and implications for diet quality and weight status. *J Acad Nutr Diet.* 2013;113(2): 1601-1609.
39. Fulkerson JA, Larson N, Horning M, Neumark-Sztainer D. A review of associations between family or shared meal frequency and dietary and weight status outcomes across the lifespan. *J Nutr Educ Behav.* 2014;46: 2-19.
40. Berge JM, Wall M, Loth K, Neumark-Sztainer D. Parenting style as a predictor of adolescent weight and weight-related behaviors. *J Adolesc Health.* 2010;46(4): 331-338.
41. Niemeier BS, Hektner JM. Weight-related health behaviors and body mass: Associations between young adults and their parents, moderated by parental authority. *Am J Health Behav.* 2012;43(6): 366-377.
42. Bandura A. Self-efficacy: Toward a unifying theory of behavioral change. *Psychol Rev.* 1977;84(2): 191-215.
43. Pearson N, Ball K, Crawford D. Parental influences on adolescent fruit consumption: The role of adolescent self-efficacy. *Health Edu Res.* 2012;27(1): 14-23.

APPENDIX B
IRB APPLICATION

Application for Institutional Review of Research INVOLVING HUMAN SUBJECTS

Note: Please complete this form thoroughly keeping in mind that the primary concern is the **potential risk** (economic, ethical, legal, physical, political, psychological/emotional, social, breach of confidentiality, or other) to the participants. Provide copies of all materials to be used in the investigation. The Institutional Review Board (IRB) must have enough information about the transactions with the participants to evaluate the risks of participation.

Name(s) and employee ID for faculty, Z-ID for students

Shannon Summers, z1686227

Status: ☐ Faculty ☒ Graduate Student ☐ Undergraduate Student

Department:

FCNS

Mailing Address (if not department):

1231 W Lincoln Hwy Apt 13 DeKalb, IL 60115

Phone: (804)543-9344

E-mail

z1686227@students.niu.edu

Project Title:

Examining the relationship between perceived parenting style and self-efficacy for fruit and vegetable consumption among university students living in residential halls

Proposed Data Collection Start Date:

April 14, 2014

Note: Unless the authorized departmental reviewer (e.g., chair or designee) has deemed on the screening form that IRB review is not needed, all projects must receive formal written clearance from the IRB Chair (or an IRB member designated by the Chair) prior to the start of data collection.

Type of Project (Check one)

☐ Departmental Research (faculty/student projects not externally funded and not indicated below)

☒ Graduate Thesis/Dissertation (IRB application should be submitted AFTER proposal defense)

Advisor/Committee Chair (& e-mail): Dr. Josephine Umoren, jxu1@niu.edu

☐ Undergraduate Project (Senior thesis/capstone, research rookies, independent study)

Advisor/Committee Chair (& e-mail):

☐ Externally Sponsored Research

A complete copy of the grant proposal or contract must accompany this application form for IRB review to take place.

• Source of Funding:

• Title of grant proposal (if different from IRB protocol):

• Name of principal investigator on grant proposal:

• Office of Sponsored Projects file number (Note: this is not the grant number):

OSP#

☐ Other

Specify:

Participants will be given the opportunity to be entered in a drawing for a \$25 Target gift card. The final page of the survey will inform participants that they will be entered into the drawing if they send an e-mail stating their name to the study e-mail address - parentingthesis@gmail.com. Therefore, their contact information will not be linked to their survey responses. Additionally, they will be informed that they will be contacted via e-mail if their name is drawn as the winner of the gift card.

2F) If applicable, explain the procedures for debriefing participants. Please attach a debriefing script or sheet [Appendix D]

N/A

Reminder: As appendices to this application, attach copies of all: **A) Recruitment information** [script/flyer/etc.], **B) Informed consent documents** [assent/parent permission/scripts/etc.], **C) Materials** [questionnaires/surveys/interview questions/listing of all information/data to be collected/etc.], **D) Debriefing information** [documents/scripts], **E) Referral list** [if appropriate]. It is the responsibility of the researcher to obtain any relevant permission for copyrighted materials. If the research involves an oral interview or focus group discussion that could evolve as it progresses, include a list of discussion topics and any "starter" questions for each topic that can reasonably be expected to be covered. If a *draft* of a written questionnaire or survey is attached, it should be clearly labeled as such and a final version must be submitted *before* data collection begins. **PLEASE NOTE THAT ANY ITEMS CAN BE ATTACHED AS SEPARATE DOCUMENTS IF NEEDED.**

Part II: Research Participants

3) Participant demographics:

• Gender: M ☐ F ☐ Both ☒

• Estimated age(s):

18+ years of age

• Are any subjects under age 18? Yes ☐ No ☒

• Potentially vulnerable populations (please indicate if any of the following groups are the **target population of the study**)

☐ Pregnant women & fetuses

☐ Prisoners

☐ Decisionally impaired/mentally disabled

☐ Specific ethnic group(s) (list in box):

If any potentially "vulnerable populations" have been indicated above, please explain the necessity for using this particular group, or if specific groups are excluded from the study, please indicate the exclusion criteria used.

N/A

• Target number of participants in the **entire study** (including controls) from start to finish (keep in mind that this is just an **estimate of the total**):

350

4) Please explain any outside institutional (i.e., schools, hospitals) approval you will need to obtain and how approval will be sought. Provide scripts, letters, or emails providing any information that will be used to obtain needed approvals/permission. It is the responsibility of the researcher to follow all applicable policies of any outside institution(s).

N/A

Part III: Risk/Benefit assessment

5) What knowledge/benefit(s) to the field will be gained from the study?

This study may provide insight into the lasting impact of parent-child relationships into young adulthood. Specifically, this may indicate how parenting style impacts their child's long-term self-confidence to consume fruits and vegetables and their adult weight-status.

6) What direct benefit(s) are there to the participant(s) (if any) from the proposed research? [For example, learning a new skill, psychological insight, teaching experience] [Please note that compensation is **NOT** considered a direct benefit.]

+

No direct benefits are expected, but participants may gain insight into their confidence level to consume fruits and vegetables and their parental relationship.

7) Describe any potential risks (breach of confidentiality, economic, ethical, legal, physical, political, psychological/emotional, social, or other) to the subjects posed by the proposed research. (Note: Some studies may have "no reasonably foreseeable risks.") Investigators are required to report all unexpected and/or adverse events to the IRB. Therefore, it is important that you list all reasonably anticipated risks because unanticipated adverse events may need to be reported by NIU to OHRP.

No foreseeable risks

- 8) Federal regulations require that researchers use procedures that minimize any risks to participants. What procedures will be used to minimize each risk and/or deal with the challenge(s) stated in "7" above?

No foreseeable risks

- 9) If support services are required to minimize risk of harm to participants, explain what will be provided (list of services available – **Appendix E**). *[A resource list for the DeKalb area is available on the ORC website – if using this, please provide a copy with your application.]*

N/A

- 10) How do the potential benefits of the study *justify* the potential risks to the participants?

N/A

Part IV: Consent Document Variations

- 11) Will audio, video, or film recording be used?

Yes ☐ No ☒

If yes, specify the recording format to be used.

N/A

Please keep in mind that specific consent must be sought in the informed consent document(s) by including a **separate signature/date line giving consent** for recording. This is in addition to the signature/date line giving consent to participate in the research project.

- 12) Will this project require the use of consent/assent documents written in a language other than English?

Yes ☐ No ☒

Reminder: If non-English documents will be used, please have the document translator **provide documentation** (email or written) that the translation is equivalent to the English version. *[This can be done after the protocol is approved in order to minimize the number of changes needed.]*

- 13) Are you requesting a **waiver of a signed** informed consent document?

Yes ☐ No ☒

Please indicate the justification for requesting this waiver:

- ☐ The only record linking the subject to the research would be the signed consent document and the principal risk of the research would be breach of confidentiality.
- ☐ The research involves minimal risk to the subjects and involves no procedures for which written consent is normally required outside of the research context (e.g., online surveys).

- 14) Are you requesting a **waiver/alteration** of some other aspect of the informed consent document?
*[This section is relevant for studies involving **deception**.]*

Yes ☐ No ☒

- 14a) Please explain which aspects of informed consent will be missing or altered along with a justification for the change.

N/A

- 14b) Please explain how the project meets all of the following criteria:

- 1) The research presents no more than minimal risk of harm to the participants.

N/A

- 2) The waiver/alteration will not adversely affect the rights or welfare of the participants.

N/A

3) The research could not practicably be carried out without the waiver or alteration.

N/A

4) Whenever appropriate, the participants will be provided with additional pertinent information after participation.

N/A

15) Will any HIPAA protected health information be collected as part of the data? Yes ☐ No ☒

If yes, describe the procedures for protecting the information.

N/A

[Please provide a copy of your HIPAA disclosure form to be given to participants.]

16) Will any protected school records be collected as part of the data? Yes ☐ No ☒

If yes, describe the procedures for protecting the information.

N/A

Part V: Confidentiality and Anonymity

17) Will identifying information be connected to the data (even through an identification key linking identities to a pseudonym or code that is kept separate from the data)? Yes ☒ (confidential data) No ☐ (anonymous data)

18) If you answered yes to the above question, describe precautions to insure the privacy of the subjects, and the confidentiality of the data, both in your possession and in reports and publications.

All data will be kept in password protected files accessible only by the investigator and advisor.

19) How will the records (data, recordings, and consent forms) be stored? Also indicate how long records will be kept and how and when they will be disposed of.

[Note: Signed informed consent documents must be maintained for 3 years following completion of the study.]

Data will be stored on the researcher's personal computer and will be disposed of after three years.

Part VI: Does this project involving deception

Yes ☐ No ☒

[complete this section only if your study includes deception]

20) Describe the deception being used. Be sure to clarify whether this is deception by omission (an important aspect of the study is withheld from the participants) or commission (the participant is misled about some aspect of the study) or both. *[Complete item 14 if aspects of consent are missing.]*

N/A

21) Why is deception a necessary and unavoidable component of the experimental design?

N/A

22) Debriefing of participants will be:

- ☐ Immediate (directly following the research session)
☐ Delayed
☐ Full (all aspects of deception will be revealed)
☐ Partial (some aspects of deception will remain unexplained)

a) If debriefing is delayed, why is the delay necessary, and when will it occur?

N/A

b) If debriefing is partial, why is the partial debriefing necessary? Would the participant be harmed in any way by full debriefing?

N/A

c) If debriefing is partial, will full debriefing occur later?

N/A

d) Does the presence of deception increase risk of harm to the participants?

N/A

e) Is the respondent free to withdraw his/her data after being fully debriefed?

N/A

23) Who will provide the debriefing?

N/A

Reminder: Please include a copy of your debriefing script/sheet with this application [Appendix D].

Part VII: Credit and Compensation

24) If participants will receive course credit for participation, please describe it below.

N/A

25) If participants will receive some other form of compensation for participation, please describe it below.

All participants will be given the opportunity to be entered to receive a \$25 Target gift card.

26) Describe any alternative tasks that will be available for participants to earn the credit or compensation.

N/A

Part VIII: Conflict of interest

27) Do any of the researchers conducting this study have any potential conflicts of interest?

[Conflicts of interest may include financial or personal interest, or any condition in which the investigator's judgment regarding a primary interest may be biased by a secondary interest.]

Yes ☐ No ☒

28) If yes to the above question, please describe the nature of the conflict of interest.

N/A

Please use the following link to access the NIU research conflict of interest policy:

<http://www.research.niu.edu/divresearch/integrity/Research%20COI%20Policy%208-24-2012.pdf>

Part IX: Researcher Qualifications

29) In addition to listing the investigators' names, indicate their qualifications to conduct procedures to be used in this study (specifically describe past experience conducting research with humans or how training will occur).

Shannon Summers, Nutrition & Dietetics graduate student with the school of Family, Consumer, and Nutrition Sciences has completed a graduate level research methods course, statistics course, and completed Human Subjects Research training.
Dr. Josephine Umoren has extensive experience as a professor, research, and thesis advisor.

30) State the date of completion of CITI Human Subjects Protection training program(s) for the individuals listed in the above question. [Note: NIU Policy requires that research investigators must complete appropriate training before conducting human subjects research.] If you have comparable training, please attach certification indicating this.

CITI (Collaborative Institutional Training Initiative) training is thorough and well recognized:

<https://www.citiprogram.org/Default.asp>

Shannon Summers completed the CITI training on November 4, 2012.

To be completed by investigator and confirmed by advisor (if student project) and departmental reviewer. Initials indicate all required parties ratify that application is complete:

Checklist of items required to accompany completed application form:

1. _____ Complete grant proposal/contract (for externally funded projects)
2. _____ All surveys, questionnaires, interview questions, or other instruments to be used
3. _____ Subject recruitment/introductory materials
4. _____ Informed consent documents (must select at least one):
 _____ Consent form for adults (if participants are age 18 or over)
 _____ Assent form for minors (if participants are under age 18)
 _____ Parental permission form (if participants are under age 18)

Initial indicating all listed materials are attached and application is complete; INCOMPLETE APPLICATIONS WILL NOT BE PROCESSED. The investigator will be notified of deficiencies in the application via e-mail from the Office of Research Compliance (ORC); if no response is received by the ORC within five (5) working days the application will be considered void.

Investigator _____ Advisor (if student project) _____ Department Chair/Designee _____

REQUIRED SIGNATURES: ALL PROJECTS

CERTIFICATION

I certify that I have read and understand the policies and procedures for research projects that involve human subjects and that I intend to comply with Northern Illinois University Policy. Any changes in the approved protocol will be submitted to the IRB for written approval prior to those changes being put into practice unless it involves an immediate safety issue for the subject during a procedure. (In such instances, the researcher is required to promptly notify the IRB after the fact.) I also understand that all non-exempt projects require review at least annually.

Investigator(s) Signature(s) Date

Signature of Faculty Advisor Date
(Student Project Only)

Authorized Departmental Review:

- ☐ Project qualifies for Administrative Review.
Cite the appropriate exempt category:
- ☐ Project qualifies for Subcommittee Review.
Cite the appropriate expedited category:
- ☐ Project is referred for review by the convened IRB.

Signature of Authorized Departmental Reviewer Printed name Date

Return this form, together with necessary documentation, to the Office of Research Compliance, Lowden Hall, 301. For information or additional assistance with the approval process, please call the office at (815) 753-8588 or access the ORC web page at www.orc.niu.edu.

APPENDIX C

IRB APPROVAL



NORTHERN ILLINOIS UNIVERSITY

Office of Research Compliance and Integrity

Lowden Hall 301 · DeKalb, IL 60115-2584

815-753-8588 · Fax 815-753-1631 · www.niu.edu/orci

07-Apr-2014

Shannon Summers

Family, Consumer and Nutrition Sciences

RE: Protocol # **HS14-0121** "**Examining the relationship between being perceived parenting style and self-efficacy for fruit and vegetable consumption among university students living in residential halls**"

Dear Shannon Summers,

Your application for institutional review of research involving human subjects was reviewed by Institutional Review Board #1 on **07-Apr-2014** and it was determined that it meets the criteria for exemption, as defined by the U. S. Department of Health and Human Services Regulations for the Protection of Human Subjects, 45 CFR 46.101(b), 2

Although this research is exempt, you have responsibilities for the ethical conduct of the research and must comply with the following:

Amendments: You are responsible for reporting any amendments or changes to your research protocol that may affect the determination of exemption and/or the specific category. This may result in your research no longer being eligible for the exemption that has been granted.

Record Keeping: You are responsible for maintaining a copy of all research related records in a secure location, in the event future verification is necessary. At a minimum these documents include: the research protocol, all questionnaires, survey instruments, interview questions and/or data collection instruments associated with this research protocol, recruiting or advertising materials, any consent forms or information sheets given to participants, all correspondence to or from the IRB, and any other pertinent documents.

Please include the **protocol number (HS14-0121)** on any documents or correspondence sent to the IRB about this study.

If you have questions or need additional information, please contact the Office of Research Compliance and Integrity at 815-753-8588.

APPENDIX D

REQUEST FOR STUDENT DATA

REQUEST FOR STUDENT DATA

(Projects will be completed as time allows.)

Please submit only the Request for Student Data page to the Office of Registration and Records and retain the attached informational sheet as your reference to the FERPA policy.

Requests with the intention of sending a 'mass email' require a mass email submission form to be submitted to and approved by the Provost Office prior to the release of information. To read the policy and find the submission form, go to ITS Home on the NIU web site and find Mass E-Mail under the E-Mail link.

Description and purpose of project (how information will be used): *(FERPA requires R&R to collect this response. Only requests with this information included will be considered.)*

The purpose of this thesis research project is to determine the relationship between perceived parenting style and self-efficacy (self-confidence) to consume fruits and vegetables in college students living away from home.

Information needed : **UG** **GRAD** **LAW** *Specify if needed*

I would like to receive e-mail addresses for all full-time students living in a residence hall on campus.

Approximate number of students you expect to receive information about: 3,987

Sequence: X Alpha by name ZIP Code Other

If needed: Residence Hall Address Local Address Permanent Address

 X E-Mail Address

Send Excel file to this NIU e-mail address:

 z1686227@students.niu.edu

Date needed:

Our office receives a large volume of requests for data. Please allow ample time to fulfill a request.

Person(s) who will have access to student data (please print):

<u>Name</u>	<u>Title</u>	<u>Department</u>	<u>Phone</u>
<u>Shannon Summers</u>	<u>Graduate Student</u>	<u>FCNS</u>	<u>(804)543-9344</u>
<u>Dr. Josephine Umoren</u>	<u>Thesis/Faculty Advisor</u>	<u>FCNS</u>	<u>(815)753-6351</u>

Statement of Confidentiality:

I will ensure that adequate measures will be taken to protect the confidentiality of the student information requested, and that only those people identified above will have access to individual data.

 Signature of Person Making Request

Date

z1686227@students.niu.edu (804)543-9344

Include your e-mail address and phone number

 Signature of Faculty Advisor (required for requests submitted by students) Date

 Printed name of Faculty Advisor and phone number

 Office of Registration and Records

Date

Approved: _____

Denied: _____

APPENDIX E

FLYER

Would you like a \$25 Target Gift Card?!?!

Are you a full-time student?

Do you live on-campus?

Are you 18 or older?

Do you have 10-15 minutes to spare?

**Participate in a thesis research study on parenting style
and fruit and vegetable consumption and be entered
to win!**

Follow this link to the survey:

<https://www.surveymonkey.com/s/parentingthesis>

**For Questions: Please contact FCNS Nutrition graduate
student Shannon Summers**

E-mail: parenting.thesis@gmail.com

Phone: (804)543-9344



APPENDIX F
INFORMED CONSENT

I understand that if I agree to participate in this study, I will be asked to complete a questionnaire on my perceived parenting style and self-efficacy for fruit and vegetable consumption. The survey will take about 10-15 minutes to complete.

I am aware that my participation in this project is voluntary and may be withdrawn at any time without penalty or prejudice. If I have any questions regarding the study I can contact Shannon Summers at parenting.thesis@niu.edu or (804)543-9344, Dr. Josephine Umoren at jxu1@niu.edu or (815)753-6251, or the Office of Research Compliance at (815)753-8588.

I understand there are no foreseeable risks and/or discomforts when participating in this study. I understand that all information gathered during this study will be kept confidential.

I understand that upon completing the questionnaire, I have the option to be entered into a drawing for a \$25 Target gift card. If I am interested in being entered into the drawing, I will enter my contact information for the last question of the questionnaire.

If you can certify the following, please begin the questionnaire:

- I am a full-time student enrolled at Northern Illinois University.
- I am at least 18 years old.
- I live on campus.
- I agree to participate in this study.

APPENDIX G

PERMISSION TO USE THE PARENTAL AUTHORITY QUESTIONNAIRE

February 16, 2014

Hi Dr. Buri,

I am a graduate student and dietetic intern at Northern Illinois University working towards a Master of Science degree in nutrition and dietetics. For my thesis, I will be investigating the relationship between perceived parenting style and self-efficacy to meet fruit and vegetable recommendations among college freshmen. I am preparing to propose my thesis and would like to ask for your permission to use the Parental Authority Questionnaire to conduct my study.

Thank you for your consideration.

Sincerely,
Shannon Summers
Dietetic Intern
M.S. Candidate - Nutrition and Dietetics
Northern Illinois University

February 17, 2014

Shannon:

Thank you for your interest in the Parental Authority Questionnaire (PAQ). Please feel free to use the PAQ for any not-for-profit purposes. For further information about the PAQ (for example, scoring details, norms, reliability measures, validity), please see the following journal articles:

Buri, J. R. (1991). Parental authority questionnaire. *Journal of Personality Assessment*, 57, 110-119.

Buri, J. R. (1989). Self-esteem and appraisals of parental behavior. *Journal of Adolescent Research*, 4, 33-49.

Buri, J. R., Louiselle, P. A., Misukanis, T. M., & Mueller, R. A. (1988). Effects of parental authoritarianism and authoritativeness on self-esteem. *Personality and Social Psychology Bulletin*, 14, 271-282.

I wish you the best with your research project.

John R. Buri, Ph.D.
Professor
Department of Psychology
University of St. Thomas

APPENDIX H

PARENTAL AUTHORITY QUESTIONNAIRE

Parental Authority Questionnaire

J.R. Buri, Department of Psychology,

University of St. Thomas, St. Paul, Mn.

Instructions: For each of the following statements, circle the number of the 5-point scale (1 = strongly disagree, 5 = strongly agree) that best describes how that statement applies to you and your caretaker(s). Try to read and think about each statement as it applies to you and your caretaker(s) during your years of growing up at home. There are no right or wrong answers, so don't spend a lot of time on any one item. Be sure not to omit any items.

If your caretaker(s) were separated or divorced before you reached age 12, think about the caretaker with whom you spent the most time when you answer the questions.

1 = Strongly disagree

2 = Disagree

3 = Neither agree nor disagree

4 = Agree

5 = Strongly agree

___ 1. While I was growing up my caretaker(s) felt that in a well-run home the children should have their way in the family as often as the caretaker(s) do.

___ 2. Even if their children didn't agree with them, my caretaker(s) felt that it was for our own good if we were forced to conform to what they thought was right.

___ 3. Whenever my caretaker(s) told me to do something as I was growing up, they expected me to do it immediately without asking any questions.

___ 4. As I was growing up, once family policy had been established, my caretaker(s) discussed the reasoning behind the policy with the children in the family.

___ 5. My caretaker(s) have always encouraged verbal give-and-take whenever I have felt that family rules and restrictions were unreasonable.

___ 6. My caretaker(s) has always felt that what children need is to be free to make up their own minds and to do what they want to do, even if this does not agree with what their caretaker(s) might want.

____7. As I was growing up my caretaker(s) did not allow me to question any decision they had made.

____8. As I was growing up my caretaker(s) directed the activities and decisions of the children in the family through reasoning and discipline.

____9. My caretaker(s) have always felt that more force should be used by caretaker(s) in order to get their children to behave the way they are supposed to.

____10. As I was growing up my caretaker(s) did not feel that I needed to obey rules and regulations of behavior simply because someone in authority had established them.

____11. As I was growing up I knew what my caretaker(s) expected of me in my family, but I also felt free to discuss those expectations with my caretaker(s) when I felt that they were unreasonable.

____12. My caretaker(s) felt that wise caretaker(s) should teach their children early just who is boss in the family.

____13. As I was growing up, my caretaker(s) seldom gave me expectations and guidelines for my behavior.

____14. Most of the time as I was growing up my caretaker(s) did what the children in the family wanted when making family decisions.

____15. As the children in my family were growing up, my caretaker(s) consistently gave us direction and guidance in rational and objective ways.

____16. As I was growing up my caretaker(s) would get very upset if I tried to disagree with them.

____17. My caretaker(s) feel that most problems in society would be solved if caretaker(s) would not restrict their children's activities, decisions, and desires as they are growing up.

____18. As I was growing up my caretaker(s) let me know what behavior they expected of me, and if I didn't meet those expectations, they punished me.

____19. As I was growing up my caretaker(s) allowed me to decide most things for myself without a lot of direction from them.

____20. As I was growing up my caretaker(s) took the children's opinions into consideration when making family decisions but they would not decide something simply because the children wanted it.

____21. My caretaker(s) did not view themselves as responsible for directing and guiding my behavior as I was growing up.

____22. My caretaker(s) had clear standards of behavior for the children in our home as I was growing up, but they were willing to adjust those standards to the needs of each of the individual children in the family.

____23. My caretaker(s) gave me direction for my behavior and activities as I was growing up and she expected me to follow their direction, but they were always willing to listen to my concerns and to discuss that direction with me.

____24. As I was growing up my caretaker(s) allowed me to form my own point of view on family matters and they generally allowed me to decide for myself what I was going to do.

____25. My caretaker(s) have always felt that most problems in society would be solved if we could get caretaker(s) to strictly and forcibly deal with their children when they don't do what they are supposed to as they are growing up.

____26. As I was growing up my caretaker(s) often told me exactly what they wanted me to do and how they expected me to do it.

____27. As I was growing up my caretaker(s) gave me clear direction for my behaviors and activities, but they were also understanding when I disagreed with them.

____28. As I was growing up my caretaker(s) did not direct the behaviors, activities, and desires of the children in the family.

____29. As I was growing up I knew what my caretaker(s) expected of me in the family and they insisted that I conform to those expectations simply out of respect for their authority.

____30. As I was growing up, if my caretaker(s) made a decision in the family that hurt me, they were willing to discuss that decision with me and to admit it if they had made a mistake.

Scoring Instructions

“A” Scale:

Total all of your responses from questions number:

1, 6, 10, 13, 14, 17, 19, 21, 24, and 28.

Enter that number here ____

“B” Scale:

Total all of your responses from questions number:

2, 3, 7, 9, 12, 16, 18, 25, 26 and 29

Enter that number here _____

“C” Scale:

Total all of your responses from questions number:

4, 5, 8, 11, 15, 20, 22, 23, 27 and 30

Enter that number here _____

Buri JR. Parental authority questionnaire. *J Pers Assess.* 1991;57(1):110-119.

APPENDIX I

PERMISSION TO USE SELF-EFFICACY SURVEY INSTRUMENT

March 5, 2014

Hi Dr. Reicks,

I am a graduate student and dietetic intern at Northern Illinois University working towards a Master of Science degree in nutrition and dietetics. For my thesis, I will be investigating the relationship between perceived parenting style and self-efficacy to meet fruit and vegetable recommendations among college freshmen. I am preparing to propose my thesis and would like to ask for your permission to use the self-efficacy scale utilized in your research project: "Associations of Decisional Balance, Processes of Change, and Self-Efficacy with Stage of Change for Increased Fruit and Vegetable Intake among Low-Income, African American Mothers."

Thank you for your consideration.

Sincerely,
Shannon Summers
Dietetic Intern
M.S. Candidate - Nutrition and Dietetics
Northern Illinois University

March 5, 2014

See attached, thanks, Marla Reicks

--

Marla Reicks, PhD, RD, Professor
Director Graduate Studies, Nutrition
Department of Food Science and Nutrition
University of Minnesota
1334 Eckles Ave.
St. Paul, MN 55108
Phone: 612-624-4735 Fax: 612-625-5272
Email: mreicks@umn.edu

APPENDIX J

SELF-EFFICACY SURVEY INSTRUMENT

How sure are you that you can do the following? Circle the one best answer for each question.

	Not at all sure	Slightly sure	Somewhat sure	Very sure	Extremely sure
I can have extra vegetables at dinner.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I can have some fruit or vegetables after a long day and I'm feeling tired.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I can have some fruit or vegetables even on days when I'm in a rush.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I can order at least one vegetable dish when eating at a restaurant.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I can have a vegetable for dinner on most days.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I can eat other fruits or vegetables when my favorite ones are unavailable.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I can eat fruit as part of my lunch on most days.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I can usually get a piece of fruit when I eat away from home.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I can eat 5 servings of fruits and vegetables most days.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Henry H, Reimer K, Smith C, Reicks M. Associations of decisional balance, processes of change, and self-efficacy with stages of change for increased fruit and vegetable intake among low-income, African American mothers. *J Am Diet Assoc.* 2006;106: 841-849.

APPENDIX K
RECRUITMENT E-MAIL

Dear participant,

Thank you for taking the time to read this e-mail. My name is Shannon Summers and I am a Nutrition & Dietetics graduate student at Northern Illinois University. I am conducting a thesis study investigating the relationship between perceived parenting styles and self-efficacy for fruit and vegetable consumption and you are invited to participate!

The questionnaire will take about 10-15 minutes to complete, and your participation is voluntary.

You have until April 30, 2014 to complete the survey.

If you choose to complete the questionnaire, you have the option of being entered to win a \$25 Target gift card.

If you have any questions, please contact:
Shannon Summers at parenting.thesis@gmail.com or (804)53-9344,
Dr. Josephine Umoren at jxu1@niu.edu or (815)753-6351, or
Office of Research Compliance at (815)753-8588

I have read and understand the above information and certify the following:

- I am a full-time student enrolled at Northern Illinois University who is at least 18 years old and lives on campus.

Please follow the link below to complete the questionnaire:
<https://www.surveymonkey.com/s/parentingstylethesis>

Your participation in this questionnaire is greatly appreciated.

Thank you,

Shannon Summers
FCNS, Nutrition & Dietetics Graduate Student

APPENDIX L
REMINDER E-MAIL

Dear participant,

Thank you for taking the time to read this e-mail. For those of you who have not participate, you still have time! Please take a few minutes and complete the questionnaire to participate in a graduate thesis research project about the relationship between perceived parenting styles and self-efficacy for fruit and vegetable consumption.

The questionnaire will take about 10-15 minutes to complete, and your participation is voluntary.

You have until May 9, 2014 to complete the survey.

If you choose to complete the questionnaire, you have the option of being entered to win a \$25 Target gift card.

If you have any questions, please contact:

Shannon Summers at parenting.thesis@gmail.com or (804)53-9344,

Dr. Josephine Umoren at jxu1@niu.edu or (815)753-6351, or

Office of Research Compliance at (815)753-8588

I have read and understand the above information and certify the following:

- I am a full-time student enrolled at Northern Illinois University who is at least 18 years old and lives on campus.

Please follow the link below to complete the questionnaire:

<https://www.surveymonkey.com/s/parentingstylethesis>

Your participation in this questionnaire is greatly appreciated.

Thank you,

Shannon Summers

FCNS, Nutrition & Dietetics Graduate Student